Indian Food Packer

All India Food Processors' Association

VOL.55 MAY- JUNE 2001 No.3

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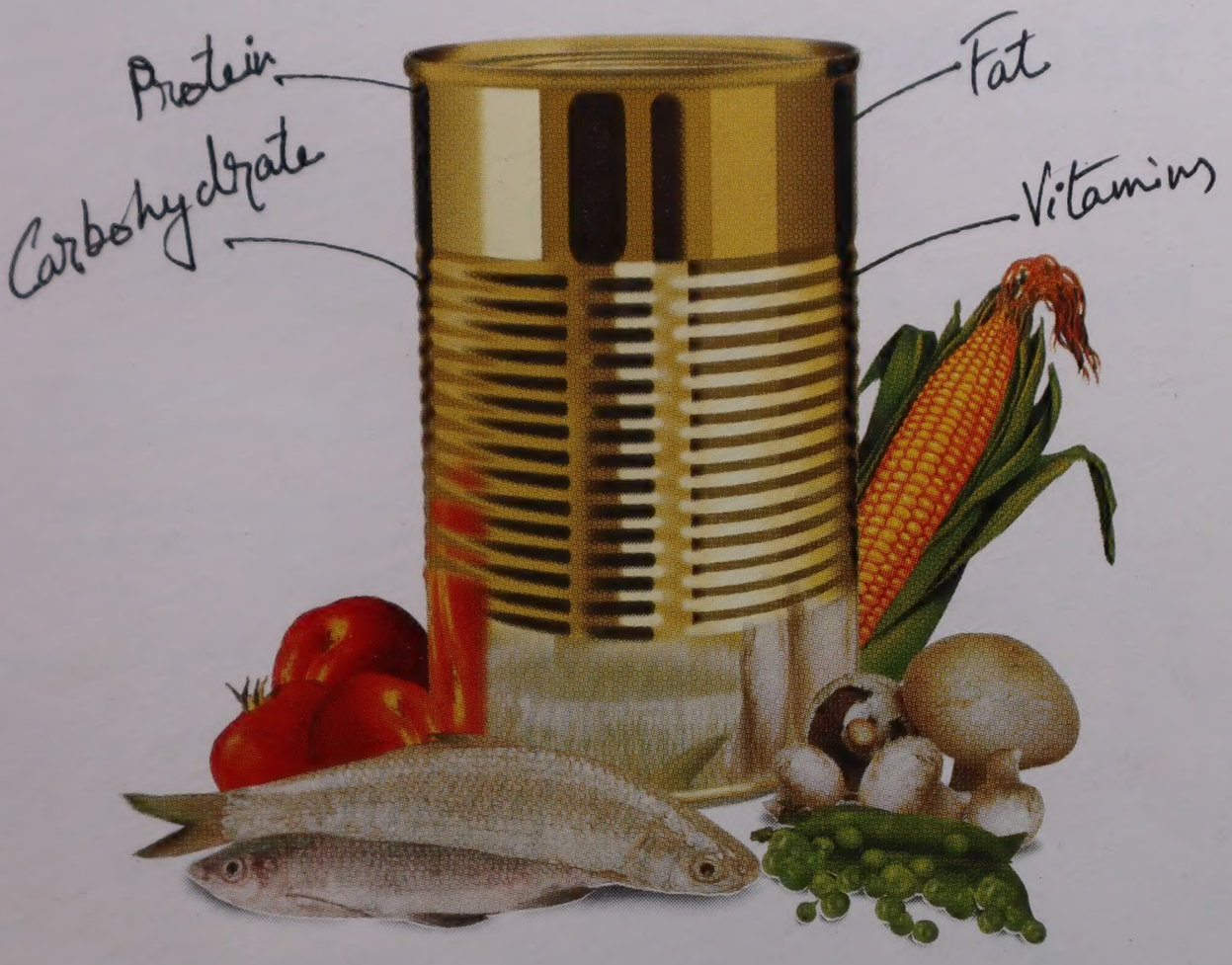

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Editorial

Packaged Drinking Water now under PFA and Declaration about Vegetarian & Non-Vegetarian Foods

Water is one of the prime necessities of man but to his misfortune good drinking water is not readily available in all parts of our country. Even, in big centres like Delhi, Mumbai, Chennai, Bangalore and Kolkata, there is not only no adequate supply of water but the quality of public water supply is far from satisfactory. The wide spread prevalence of water borne diseases is a result of this pathetic state of affairs. The launch of bottled drinking water and mineral water has therefore come as a boon to the consumers although it is restricted to certain class of consumers. Travelling public is one of the largest consumers. Bottled drinking water is a big business with an annual turnover of over Rs. 700 crores and is expected to grow by leaps and bounds in the years to come. There are several manufacturers spread over different parts of the country selling bottled water under various brand names. Some are well known like Bisleri of Parles, Kinely of Coca-Cola, Aquafina of Pepsi, Pure Life of Nestle, etc. Although the bottled water was supposed to conform to WHO Standards there have been several spurious brands of substandard quality being marketed. It was therefore of primel need to bring it under some regulatory mechanism so that the consumer is assured of good quality in all respects. Packaged drinking water has now been declared as Food and brought under the Prevention of Food Adulteration Act. It has also been made mandatory that all packaged drinking water sold in India should invariably carry the BIS Certification mark to ensure that the quality of bottled water is good and serves the interests of the consumers. Let us hope that Packaged Drinking Water Industry will keep up the best standards and ensure supply of good quality water.

The Ministy of Health has recently brought out two notifications under the PFA on declaring processed foods clearly as "Non-Vegetarian" and "Vegetarian" on the labels, containers, pamphlets, leaflets, advertisement in any media along with prominent display of prescribed symbols in brown and green colour respectively. Today, most of the manufacturers get their labels, leaflets etc. printed in only one colour, mostly black. With the above amendments, the labels etc. will have to be in two colours which will unnecessarily add to the cost. All the ingredients used for making the packed food are already being mentioned on the label from which one can easily distinguish whether the food is vegetarian or non-vegetarian in nature. The amendments seem to be therefore superfluous and will only mean additional burden on the manufacturers. It is hoped that the authorities will review their decision and withdraw the notification.

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ASSOCIATION NEWS

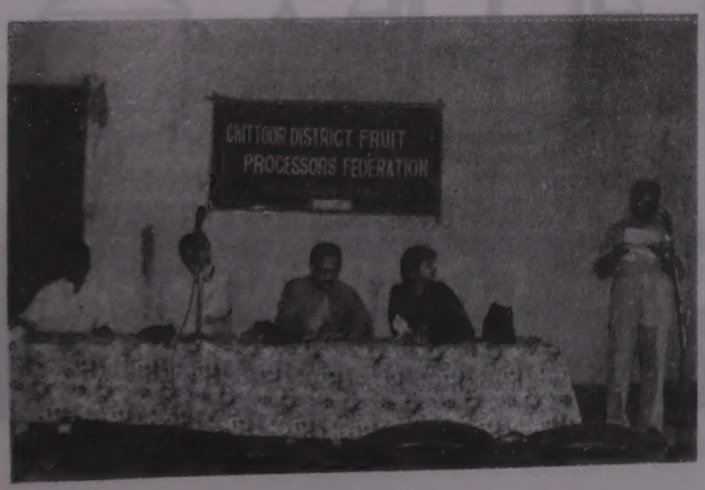
Proceedings of the Meeting of Chittoor Chapter of AIFPA held on 12.4.2001 at M/s Venugopal Fruit Processing Industries, Chittoor

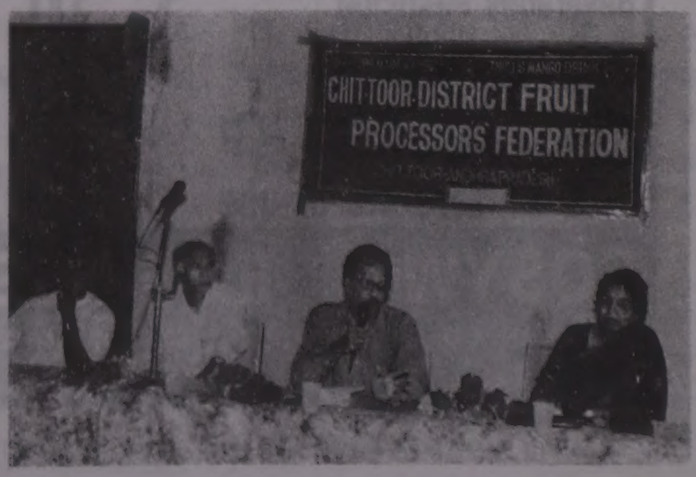
Mr. G. J. Ravindranath, General Secretary, Chittoor Dist. Fruit Processors' Federation, welcomed the gathering and read out the programme for the day. The Meeting was convened to discuss the following issues:

1. To thank AIFPA for representing to the Finance Minister, to withdraw Fruit and Vegetable products from Excise purview.
2. Introduction of FRAC Laboratories and their services to the Food Industry.
3. Focus on the present crop situation and the proper planning of production during the 2001 season.
4. Discuss about the proper arrangements for procuring the fruits and control of inflated rates.
5. Selecting a common brand name for the products processed in the Chittoor Federation and to promote the sales abroad.
6. Introducing Juice vending machines and plan to introduce Mango Juice in Tetra packs.

Mr. K. Balakrishna Reddy, the President of the Chittor Dist. Fruit Processors' Federation was asked to address the gathering. Mr. Reddy thanked and congratulated the office bearers of AIFPA for their successful efforts in getting Fruit & Vegetable products exempted from Excise. He also said that it is the vision of the Federation to commence the sales of Mango Juice by introducing vending machines in different parts of the town & also at Tirumala to begin with. He also proposed to pack and sell Mango Juice in Tetra packs under the Federation brand name for which the packing could initially be undertaken by existing Tetra packs units against job work.

Mrs. Mridul Salgame, Director, FRESH, and Member of the Regional Food Research & Analysis Centre, Bangalore, said that a group of Industry related professionals have come forward and has setup the Food Research and Analysis Centre (FRAC), New Delhi with foundation of Food Research and Enterprise for Safety and Hygiene (FRESH) Regional Centre at Bangalore.





She expressed that FRAC is a well established and reputed Laboratory, sponsored by the Federation of Indian Chambers of Commerce and Industry and supported by the Ministry of Food Processing Industries, Government of India. She conveyed that FRAC is a Non- Profitable Organisation and that all food related tests could be analysed at Bangalore as well as New Delhi.

Mr. P. T. Raju, Chairman, South Zone, AIFPA, suggested to all the Canners to make use of the facilities provided by FRAC. He also requested the Federation to come out with common brand name and if so, he has promised to procure export orders for Mango pulp for the Chittoor cluster. He also said that for any problem faced by members they can approach or write to him. He promised to help them to sort out the problems. He requested all the processing units to enroll themselves as Members of the Association.

Mr. Acharya of Parle Exports Limited, suggested that a Farmers' Co-Operative should be formed wherein Mangoes could be sold and purchased in an organized manner thus giving less choice for exploitation.

Mr. N.Ramachandra Reddy and few Mango Merchants expressed that Totapuri Mangoes during the forthcoming 2001 season may cost an average price of Rs.3000/- to Rs.4000/- per MT.

30 Members from the Processing units attended the meeting .

The Meeting concluded with a vote of thanks proposed by our Secretary Sri G. J. Ravindranath.

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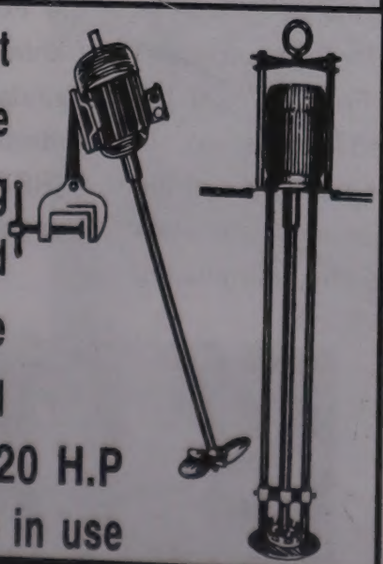

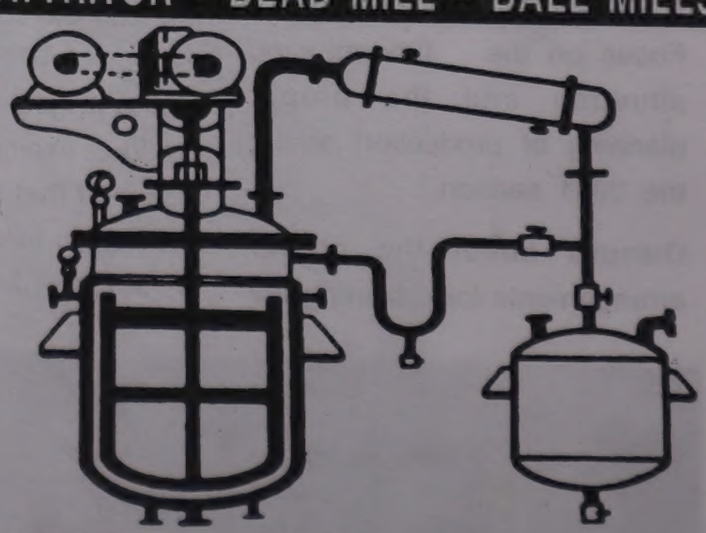

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NEWS ROUNDUP

Indo-French Initiative

The sixth meeting of the Indo French Initiatives Forum was held in New Delhi on the 19th -20th February 2001. The Forum was created following the State visit of the President of the French Republic to India, on the 24th -26th January 1998. It is co-chaired on French side by Mr. Jean Francis-poncet, former Minister of Foreign Affairs of France and presently member of Parliament and Chairman of Foreign Affairs Committee of the Senate, and on the Indian side by Mr. Ramakrishna Hegde, former Union Minister for Commerce & Industry and presently Member of Parliament.

This meeting was particularly successful. In the economic field it has identified three priority sectors for development: water-new technologies -food processing.

In the Food Processing Sector, Agricultural co-operation proposals included the conservation of fruits and flowers by the French cold chain methods and increased interaction between Indian and French agricultural co-operatives for mutual benefit.

☆ ☆ ☆

Study recommends New Export - Oriented Food Processing Policy

There is a need for evolving a consistent policy for export of processed agro products in which India has a competitive edge.

A study conducted by the Australian Centre for International Agricultural Research (ACIAR), Canberra, and the Indian Council of Agricultural Research (ICAR), New Delhi, has indicated that there are better prospects for exports of processed agro products in comparison to export of grains and raw agro produce

Export of wheat has been erratic. While in some years huge quantities of wheat were exported, in other years the country has to go in for massive imports. Exports exceeding 0.5 per cent of the domestic output have led to strong inflationary pressure on domestic market prices.

After making adjustments for domestic transport and marketing cost, exports at the existing freight on board (f.o.b) rate raises domestic price of wheat marginally. If the country can export wheat at international price, the domestic price increases by 9 percent. India used to export basmati rice. Since 1995-96 export of non basmati rice has dominated rice trade with exports of about five million tonnes in recent years. India even in this segment has not been able to establish its hold on the rice export market. As a result, prices for exports are 14 to 23 per cent lower than that in the International market for the comparable grade.

It is in the field of export of processed foods and processed agro products that the real comparative advantage for India lies, says the study.

Processed Food Industry March 2001

☆ ☆ ☆

Reduce Tax for Growth: Experts

Agriculture experts have asked the government to focus on developing the food processing sector and reduce high incidence of taxes in order to attain an agriculture growth rate of 4 per cent to 5 percent.

During consultations with the Planning Commission for the preparation of the Approach Paper of the tenth five year plan, experts

said a 4 per cent to 5 percent growth rate is possible, but share of food processing sector has to be increased from the present level of 2 per cent on the lines of countries like Brazil, where it is 65 per cent of the produce.

Official sources said the experts also called for a reduction in the taxation imposed in the sector.

The taxation should be only on end produce and on value addition.

The recommendations of the experts assume significance as the Commission is trying to examine the feasibility of 9 per cent economic growth rate as directed by Prime Minister Mr. Atal Behari Vajpayee.

However, if agriculture growth rate can be accelerated to 4.7 per cent, the exports growth rate drops sharply to 15 per cent, the sources said.

The experts pointed out that the agriculture markets in the country were fragmented and the marketing system has far too many intermediaries.

"The Agriculture Produce Market Committee's (APMCs) Act encourages commission agents," they said adding that there was also a need to deregulate the food sector.

There are over 134 orders which regulate the food industry and there is an urgency to rationalise or dispense with them especially in the wake of the WTO regime, they said.

Calling for privatisation of the research and development facilities in agriculture they said the network of food laboratories should be expanded and a comprehensive crop management strategy should adopted.

Agriculture experts who participated in consultation with the Planning Commission deputy chairman Mr. KC Pant, included Mr. Y.K.Modi, Mr R.Tyagrajan of ISMA, Apeda ex-chairman Mr. Gokul Patnaik and Prof. Charan Wadhwa.

Processed Food Industry March 2001

☆ ☆ ☆

Ministry plans to monitor Imported Foods entry

The Union Health Ministry is likely to approach the Customs Department to allow the import of only those processed foods that have more than 50 per cent shelf-life. It has become necessary in view of the foreign foods being flooded in the market with inconsistent labels and with expiry dates.

The Health Ministry has taken a serious view about the increase in the import of food products with expiry dates that lapse soon after they enter the domestic market.

"As far as food products coming into the domestic market, the Prevention of Food Adulteration Act (PFA), 1954 covers areas like adulterated food and misbranded food. The issue of expiry date is not covered."

The Health Ministry feels that since necessary amendment in the PFA would take more time it plans to seek the Customs Department's help to incorporate the necessary rules to check the validity of products coming into the country on the labels and that too in Hindi or English language.

Processed Food Industry March 2001

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Restrictions on imported tinned food in the offing

The government is likely to put restrictions on import of tinned food by making it mandatory for importers to specify the expiry date and other related information in English, Hindi and one Indian language.

Speaking on the sidelines of a post-Exim Policy seminar organised by PHDCCI, director general foreign trade NL Lakhnpal said: "We will take steps to ensure that food which has expiry date of less than six months is not brought into the country."

Lakhnpal said that the DGFT would also review labelling and packaging requirements of tinned food imported from abroad.

Though the government is planning to extend all laws and standards applicable to imported goods also, most tinned food items manufactured in India do not give

product details in Hindi or other Indian languages.

The government will also review canalisation through Minerals and Metals Trading Corporation and State Trading corporation.

Business Standard *3-4-2001*

Local industry to be protected for limited time

The government today hinted towards protecting the domestic industry only for a limited period. Speaking at the National Seminar on Exim Policy-2001, organised by the Federation of Indian Chambers of Commerce and Industry (Ficci), Commerce and Industry minister Murasoli Maran said that protectionism is correct during the transition- al period.

" Infant industries need protection but infants must mature," he said. The minister had on Saturday announced the removal of quantitative restrictions on the remaining 715 items in this year's Exim Policy thus completing the programme of dismantling QRs on 10,202 tariff lines that commenced in 1996.

Maran also said that this year's policy was aimed at striking a judicious balance between the long-term requirements and the immediate concerns of the industry.

Business Standard *3-4-2001*

QR effect seen minimal on food processing sector

The removal of quantitative restrictions (QRs) on the business of processed food industry in the country is expected to have negligible effect in the near future, industry experts say.

It will be negligible as the business is already dominated by few multinational companies. Besides, the domestic processed food market is minuscule as compared to the total domestic food market. Hence, the processed food market may not be a priority for most of the MNCs.

However, in the long run, the processed food consumption in the country is expected to grow at an enormous rate. In such a case India may be the net importer of food products form all over the world.

According to a Delhi-based agri-business company, India will become a net exporter of agricultural commodities and services to the world market. At the same time, the country is likely to import the processed product of the very commodity which it would export.

In the post liberalisation period, Indian processed food industry had experienced the entry over dozen MNCs by way of fresh investments and takeovers. But most of the leading Indian companies in this sector have been unaffected due to their comparative advantages and competitiveness in business.

This apart, the area of focus varied widely although there is a vigorous competition between the domestic companies are focussed to build their volumes in biscuit, tea, coffee and alcoholic beverages because of mass consumption.

The MNCs which are already operating in India include Hindustan Lever, Best Food international, Coca Cola, Cadbury, Agrotech India Ltd. Smithcline Beecham and Danone.

The domestic companies which are in the field include Parle, Britannia, Pioma, UB, Shaw Wallace, Dabur, Tata, Jagajit, Amrit and Godrej.

Earlier, when QRs were removed on several items, imports of processed food products increased. The major imported items are chocolates, bakery products, juices, alcoholic beverages, tea, sauces, jam, coffee, dairy products and other food raw material. Across the country, there are over 100 importers who are in association with 400 distributiors and 600 retailers.

The imported processed food market is estimated to be around Rs.160 crore in 2000-2001. The products are effectively catering to the needs of elite Indian urbanites, between the age group of 20 to 40, who travel abroad frequently. The NCEAR survey estimates that there are some1.8 million homes with 7.2 million people who are potential consumers of processed foods.

Business line *3 April 2001*

Call to farm sector to up exports

Agri-Exports from the country can make a dent in the world markets if adequate measures are taken to tackle infrastructure bottlenecks that hinder its competitiveness. according to PM's economic council member Jagdish Shettigar.

Addressing a workshop on the Exim policy on Tuesday. He said the country now needs a proper anti-dumping and safeguard mechanism to take care of any adverse impacts in the wake of lifting the QRs. "Normally it takes six to seven months to determine any case of dumping," he aded.

Proposing a selective continuance of the duty entitlement pass book scheme. DGFT joint director Ajay Sahay said the "war room" will comprise representatives from key ministries so as to take quick decisions.

Later, Chief customs commissioner. Delhi SP Srivastva said one interesting feature of the Exim policy is that for the first time the states are being involved in the making of the agri-policy and the focus on the regional rural products.

A former DGFT additional director general RK Dhawan said the government needs to have some consideration for the SSI sector, which needs some time to adjust to imports.

Allaying fears of any large-scale adverse impacts on the industry due to the free imports regime. TR Rustagi said. "there was misplaced fear of the industry being wiped away. "He said that after the lifting of the QRs, there is no reason as to why the high tariffs should continue. "Now with the removal of the QRs even the incentives like duty drawback levels should come down."

He said he is hopeful that like in the past this time too, the domestic industry will meet the challenges.

Financial Express *4-4-2001*

☆ ☆ ☆

CERC plea on food labelling

The Consumer Education Research Centre. (CERC) has urged the Prime Minister, Mr Atal Bihari Vajapee, and the Ministries concerned to intervene into the mater regarding labelling of food items according to its vegetarian and non-vegetarian contents.

In a written representation to the Prime Minister, the CERC stressed, "Every consumer has the right to know what he is eating and what he should not be allowed or made to eat without his knowledge or consent."

Business Line *17-3-2001*

☆ ☆ ☆

NDDB market to supply 30% of fruit, vegetable to Bangalore city

The Rs.150 crore Safal fruit and vegetable auction market being set up in Bangalore by the Anand based National Dairy Development Board or NDDB has proposed to eventually supply 30 per cent of fresh fruit and vegetables to the mega city when completed, with provision for 100 per cent expansion in future.

The stone for the unique project was laid by Karnataka Chief Minister SM Krishna in the presence of his colleagues and Gujarat Cooperative Milk Marketing Federation (GCMMF) chairman V Kurien, among others according to an NDDB press release issued here.

Speaking on the occasion he said the alternative auction based market sought to free the farmers' dependence on credit from middle men and give them an incentive for improving quality and productivity.

NDDB chairperson Amrita Patel also present on the occasion said the project envisaged that the entire farmer -to -consumer chain became more efffcient with a view to providing improved technology to small and poor farmers to increase their income.

The project is an outcome of an MoU signed between NDDB and Government of Karnataka last year, after NDDB completed a detailed feasibility study.

The Safal F&V Auction Market would comprise a central auction facility with 100 wholesale shops, a 10,000 tonne capacity cold storage for bulk produces like potato and processing unit for fruits and vegetables. It would be initially managed by NDDB, to be set up in the farm produce growing areas.

The forward linkage would be through 8 to 10 cash -and carry grocery stores to be constructed at strategic locations in the city in addition to four such stores at the auction market itself.

Financial Express *19-4-2001*

☆ ☆ ☆

Plea on processed foods legislation

The Associated Chambers of Commerce and Industry of India (Assocham) has advocated the enactment of a comprehensive Processed Food Development Act.

The chamber has said this Act should contain enabling provision for regulating the imports, manufacture and sale of genetically-modified food items in the country.

In a statement, the chamber has also urged the Government to set up a single umbrella authority for effectively countering the post-QR challenges of surge in import of food items.

Business Line *5-4-2001*

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Imported brands must advertise to survive.

Marketers Realise the need to Build Brands, Expand Range to Compete.

Partial removal of quantitative restrictions two years back gave rise to a new breed of marketers. They started importing well-known international food and personal care brands and selling them in India. Today, with the removal of quantitative restrictions, most of these marketers are looking at two things: expanding their product range and creating awareness for the foreign brands they market in India.

One of the biggest reasons behind gearing up their operations is the fact that the total number of marketing agencies, that is , the importers or traders, will soon double from the current figure of 400 says a senior official at Fourseasons Marketing "Importing has opened a new avenue of profitable business. But the business is bound to get more competitive as the number of importers rises significantly after the removal of QRs.

So what does Fourseasons plan to do? It will soon add some Australian wine brand to its list of products it imports, Currently, the company imports Macadamia Nuts, chocolates, Nut Oil under the brand Mauna Loa, apart from coffee and cereals under the Super brand from Singapore. At a later stage, Fourseasons hopes to start manufacturing Macadamia Nut Oil in India Also on the anvil are plans to get into the personal care product range by the end of the year.

Meanwhile, Laxman Rai, directror of the trading company Rai & Sons says that it will soon expand its product portfolio to include non-alcoholic beer from Denmark. The company imports brands like Ferrero Rocher chocolates, Hero jam, The Laughing Cow cheese etc.

Universal Impex, which was earlier into chemicals and constructions, has recently launched hair colours, gels, shampoos, sprays etc under the brand name Caring, from Thailand. The company will soon launch a perfumed coconut oil for body and hair. MB International, which imports Paton's Macadamia chocolates, will now bring in barbecue sauces, jams and macadamia nut oil.

To compete and to push sales, most foreign brand marketers are gearing up their advertising plans. To promote its cheese brand. The Laughing Cow, Fromageries Bel will spend Rs 50 lakh on advertising and promotions. At a later stage, The Laughing Cow will use television to create brand awareness.

One the other hand, officials at Fourseasons Marketing says that the company would focus on below-the-line promotions for its brand, Mauna Loa. "We will mainly focus on in-shop activities and print advertising," says the official. Interestingly, by the end of the year, it may also launch a television campaign.

Mohit Narang, director, Universal Impex says that the company will strengthen its net work and create brand awareness via both below-the-line advertising, above -the -line advertising, In addition, seminars, workshops, telemarketing, hair shows, road shows, direct mailers, etc will be used to create brand awareness.

Viral Mehta, managing director of Mumbai-based Veekay Foods & Beverages Pvt. Ltd says that advertising of brands is key not only to build the brand but also to change their "trade" image. "We want to build a relationship with the parent companies through brand building exercises, "he says.

Business Standard *6-4-2001*

Heat spell takes sap out of mango processors

Despite initial reports of a bumper mango crop, fruit processors are concerned over the crop situation because of prevailing dry conditions.

According to Mr Govardhana Bobby, Executive Member, Chittoor District Fruit Processor's Federation, Andhra Pradesh, the heat spell tends to make the mangoes drop-off before they are fully ripe. With arrivals, particularly that of 'Thothapuri' the major variety used for processing expected only in May-end, the processors are keeping their fingers crossed. Even a short spell of rain could save the day, he said.

Meanwhile, with initial indications optimistic, estimates peg average prices of Thothapuri around Rs. 3,000 per tonne, he said. This was just a third of the price last year when mango production was low. Even allowing for any increase later in the season, prices were likely to rule lower than that of last year, he said.

During the processing season set to commence with raw material arrivals, mango pulp prices, too, could rule low, he said. Last year, prices had ranged around Rs.535 per carton (18.6 kg) and off-take had not matched production. Pulp inventories with the processors was high, and with reports of a good crop, prices were bound to rule low. At present a carton fetched around Rs. 425, he said.

In Chittor district and surrounding areas, there were over 35 processing units each with an average capacity to produce about 1,250 tonnes of mango pulp per season. Most of the production was exported through merchant exporters who controlled the marketing, he said.

To improve offtake in the local market, he said, the federation was planning to put up juice dispensers in Chittor and later in other major towns. Mango juice would, be marketed under a common brand, Seven Hills, he said.

In Tamil Nadu, in the processing belt at Krishnagiri and Dharmapuri, Thothapuri price estimates for the season range around Rs.3,000-4,000. This is the minimum price and could fluctuate later in the season. The dry spell makes it a little early to predict, according to Mr.D.C.Manivannan, Chairman, Thenamothu Foods(P) Ltd, a leading processor.

Alphonso arrivals were expected by April-end and Thothapuri by May-end. There were over 22-25 units processing mangoes in this belt. And four or five more units were being established, he said. The units exported about 70 containers (18.6 tonne per container) during the year.

Due to the absence of a concerted marketing effort and domination by merchant exporters, prices were low, he said. Competition between units aggravated the problem and prices were at an all-time low of around Rs 300-325 per carton. This did not even meet the cost of production of around Rs 500, he said.

Last season, despite low mango output, producers dumped them with processors as their prices were better than the open market. Pulp output was high and about 150 containers worth of stocks were available with the processors, he said. To this the current season's stocks would be added, he said.

Mr G.Shankar. Director, Thenamoothu Foods felt that even if the mango output dropped later in the season due to the dry spell the processors would have sufficient raw material. Year after year, the

area under mango crop was on the increase, and this would ensure supplies, he said.

Business Line *6-4-2001*

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Indian meat export likely to increase"

The recent outbreak of foot-and mouth disease (FMD) in European countries has provided an opportunity to increase the export of risk-free Indian meat, the president of the All India Meat & Livestock Exporters Association (AIMLEA), Mr Irfan Allana has claimed at a press conference, Dismissing reports about FMD spreading to some, Indian states and affecting the quality of export meat, Mr. Allana stated that the animal health situation in the regions where export establishments are operating, such as Uttar Pradesh, Andhra Pradesh and Maharashtra, remain FMD free. Even the alleged FMD cases in Haryana and Punjab are not cause for major concern as per the clarificatio9n issued by the government's animal husbandry department, the note said.

The release termed the recent suspension of meat imports in countries such as Egypt and Saudi Arabia as part of a broader programme to review their present import protocols.

Although India has been exporting meat to 54 countries during the past 32 years. There has been not a single incidence of livestock -related disease outbreak in any of the countries. AIMLEA claimed.

Almost 93 per cent of India's meat exports consist of deboned, deglanded frozen buffalo meat, the release said, adding it is a completely risk free product having pH below 6.0. Such a condition, the release said, is brought about by the compulsory chilling of the carcasses for at least 24 hours at two to four degrees Celsius. The OIE in Paris has confirmed that the meat prepared under such conditions will ensure that there is no risk of transmission of the FMD virus.

Statesman *8-4-2001*

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Dumping duty remedy against imported agricultural goods

After industry, it is now the turn of the domestic agricultural farmers to seek protection if they find imported agricultural products threaten to price them out of farming operation through the instrumentality of the antidumping machinery.

Talking to newspersons about a national convention on antidumping strategy to be convened in mid-May here, the Designated Authority in the Directorate General of Anti-Dumping and Allied Duties (DGAD), Mr L.V.Saptharishi, said that there are well-established rules and procedures for initiation of dumping of industrial goods against foreign exporters by domestic industry.

But, in the case of agricultural products, most of which have been freed from quantitative restrictions (QRs) in the recent Exim policy, there are no ready-to-act machinery in case there is an import surge of specific farm goods which might jeopardise the very survival of domestic farmers.

"So far, there have been no cases of dumping of agricultural products. But it would be quite difficult for us to take the problem of dumping of agricultural products individually by small farmers" without their being banded together through an assocation, Mr Saptharishi said.

Officials of DGAD said that when Thai or Chinese rice are being dumped here, farmers in Punjab who constitute the major rice-growing State in the country, could file a petition on behalf of domestic rice-growers and approach the DGDA to seek redressal of grivevance.

Asked whether there is any precedent for slapping antidumping duty against farm products, the officials said that is why "we have to evolve rules in this regard and see that domestic farmers are not left high and dry when import surge occurs."

Countries like Japan and China have effective system of safeguarding their domestic farmers from import threat and it is possible that the domestic growers might band together and approach the authorities, initiation of dumping investigation could be done.

In response to a query about the proposed national convention, Mr. Saptharishi said that it is being designed to deliberate upon the existing rules governing anti-dumping, the deficiencies in the system and the "grey areas" which cause a lot of friction between the user industry of the dumped products and the injured indigenous industry.

He said the Government has set up a group of lawyers, officials of DGAD and Industrial councils to go into the issue of strengthening the rules and rendering them user-friendly.

The discussions would centre around the problem of information, post-QR removal scenario and the likely impact of liberalisation.

Representatives of the All-India Association of Domestic Industries Against Dumping would also take part in the deliberations to lend their side of the picture to arrive at clarity on dumping issues, officials said.

Mr Saptharishi clarified that the meeting would not deliberate on specific products but across the - board group of domestic industries which have been threatened by cheap imported goods.

Business Line *17-4-2001*

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Marine Product exports up 23.3%

Marine product exports from the ecountry increased by 23.3 per cent to Rs 6,300 crore in 2000-01 as against Rs 5,117 crore in 1999-2000. In dollar terms, marine product exports rose 16.6 per cent to $1,387 million in 2000-01 as compared to $1189 million of the previous year, the Marine Products Export Development Authority (MPEDA) said in a statement here. India exported 4.21 lakh tonnes of marine products in 2000-01 against 3.43 lakh tonnes exported in 1999-2000, showing an increase of 22.8 per cent. Chennai port stood first in terms of value of exports, followed by Kochi and Vizag. All the major ports except-Kochi showed an increase in value of exports. Exports through Kochi port dropped from Rs. 1,137 crore in 1999-2000 to Rs 1,031 crore in 2000-01. The share of Kochi has dropped from 37,9 per cent of the total value of exports 10 years ago to 16.3 per cent in 2000-01, The main increase during the first 11 months of 2000-01 came from exports to US. The increase in exports to US over the previous year was nearly 55 per cent, mpeda said.

Economic Times *18-4-2001*

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Poor arrival of seeds, fall in prices hit soyabean processing

Soyabean processing in India has slowed down due to poor seed arrivals and fall in domestic soyoil prices, Traders said today.

"Seed availability is not enough to have normal kind of activities. Processing plants are running at just 15 to 20 percent of their rated capacities," Davish Jain , managing director of Prestige Soy Industries, said.

He said soybean processing had declined to about 100,000 tonnes a month compared with 600,000 - 650,000 tonnes a month in November and December when trading activity was at its peak.

Traders said soybean arrivals had dipped drastically due to the end of the peak trading season in March and depressed domestic soymeal and soyoil prices.

"Seed availability is currently about 5,000 tonnes per day against 50,000 to 60,000 tonnes in November - December," said O P Goel, chairman of the Soybean Processors Association of India.

Traders said soymeal prices were currently quoted at $176-177 per tonnes FAS (free alongside ship) at Mumbai port compared with $182-183 a tonne a month ago.

Price of refined soyoil also declined to Rs 26,400-26,500 ($562-564) a tonne on April 16 from Rs 27,700-27,800 on March 30.

"Poor demand of soymeal in the global market and soyoil in India has depressed domestic prices," said B Tibrewala, chief executive of the solvent extraction unit of Gujarat Ambuja Exports.

The current trends may continue during the rest of the trading season, ending in October, traders said.

Traders said demand for Indian soymeal was poor in the global market due to easy availability of the meal from South America at competitive prices.

"The South American meal is being offered at cheaper rates."

At these prices, Indian traders can't commit huge quantities for exports, Jain said.

He said low-pro Argentine meal and US high -pro meal were currently quoted in Malaysia at around $ 175 and $205 a tonne C & F respectively. Indian meal prices were ruling at $203 a tonne.

Indian soymeal stands between Argentine low-pro and US highpro in terms of quality, traders said.

Ravi Sethi, director of Malwa Vanaspati and Chemicals Ltd, said domestic traders were now concentrating on the local market because the demand could go up in May.

"Availability of animal feed based on mustard and groundnut extractions will be low in May," he said, adding that the domestic soymeal demand could go up during that period.

The demand is also expected to increase due to shortage of green fodder in the summer season, he added.

Some traders said about 500,000 tonnes each of soymeal could be sold in the international and the domestic markets in the remaining months of the season (November- October).

According to the Solvent Extractors' Association of India (SEAI), soymeal exports between April 2000 and February 2001 totalled 1.89 million tonnes, the same as the corresponding period in the previous year.

Soyabean production is forecast at 5.35 million tonnes in 2000/01 (November-October) against 5.20 million tonnes in the previous year, SEAI said.

Economic Times *18-4-2001*

Concerns arise about safety of GM foods

The industry may be very optimistic about biotech but there is a flip side, specially in agri-biotech Genetically modified (GM) food, for instance, has triggered a wave of apprehension the world-over and consumers are increasingly wary of the composition of biotech food.

In this context transparency is very essential as safety of food is of concern to the consumer, said Central Food Technological Research Institute director Prof V Prakash.

"The prevention of food adulteration act (PFA) needs to be revisited in the biotech era," he said.

Agri - biotech could also emerge as a big sector with increasing pressure to create more food using lesser resources. Today, the country is the second largest producer of food after China.

Though genetically modified foods have not yet hit the market, Prof Prakash believes that in less than five years a lot of GM food products will be available off the shelves.

And while ensuring safety of the product is the greatest challenge for the food industry, packaging is also likely to emerge as contentious issue.

"It will be imperative for food producers to lebel their products comprehensively," Prof Prakash said.

The ground rules on labelling of biotech foods is that the consumer should be provided complete information about the products.

"If the product contains anything that has allergens, that is substances that could potentially trigger an allergic reaction in the body, it must be mentioned clearly on the label," he added.

Currently, the best option for those in the agri-biotech sector is to follow Codex, which is an international body that issues guidelines to the food industry.

Intellectual property rights could also be an area of concern for the sector.

"Most developing countries have their fair share of problems with

patenting," Prof Prakash said.

The solution to this, he suggested is to strees on documentation "Documentation is an absolute requirement especially considering that we need to capitalise on our biodiversity," he said.

Economic Times *18-4-2001*

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Spicing up paprika exports

The area and productivity for paprika is coming down in western countries but the demand is increasing. The only way out to meet global demand is to bring new areas in tropical countries under the crop and India has the maximum potential in that respect.

Indian agricultural products have good export potential provide they conform to international quality standards. Paprika has been identified as a product that has good potential and which the Indian farmer can easily grow in the prevailing agro-climatic conditions.

Paprika is a European variety of *capsicum annum* bearing mildly flavoured fruits. It belongs to the *Solanaceae* family, a native of Mexico and Central America. Originally, the New World capsicums were pungent but, when introduced in Europe under different soils and agro-climatic situations, cross-pollination and genetic recombinations occurred, turning them into mild and sweet red capsicums called paprika.

"Now for all commercial purposes, paprika is a broad shouldered, dark or cherry red, thick skinned, sweet or non-pungent elongated fruit," says N B Gaddagimath, director R &D and managing partner, Sarpan Agri Horticultural Research Centre, Dharwad. He has done pioneering research work on paprika. In fact, the first Indian Paprika SB-106 was released from Karnataka from Sarpan Agri Horticultural Research Centre by Dr Gaddagimath in 92-93. A large trial cultivation on 2,000 to 3,000 acres was made in 97-98 by the same organisation.

The highly coloured condiment derived from the dried fruit is a popular flavouring and colouring agent in foods. In western countries, paprika is preferred because of its low pungency. The pungency of chillies is measured in Scoville Heat Units (SHU). The SHU of paprika is close to zero.

The fruits are picked when they turn a bright red and rare mechanically dried to retain the colour and reduce microbial growth . If not processed immediately, they turn black. Hence, they need good storage and integrated processing facilities to exploit the quality.

Paprika is mainly consumed as ground spice powder in cuisine. The oil extract from paprika, oleoresin, is being used in food industries, confectionaries, cosmetic industries, beverage industries for toning of fresh wine, meat industries, pharmaceutical industries (as an anti-irritant and a pain killer and for capsule colouration), in the poultry and cattle-feed industries and as a dye in textile industries.

According to G V G Rao, vice president agri-operations of the $2 billion Thapar Group's Global Green Company, the world market for paprika could be between 100,000 tonnes to 150,000 tonnes annually. Global Green is at present cultivating 3,500 tonnes of the crop on 1,500 acres in Andhra Pradesh and Karnataka on a 100 per cent buyback arrangement. It also has processing plants in these states. For the first time the company has bagged an export order for 800 tonnes of paprika from the US for this calendar year.

Good quality paprika today is available in the Indian market at approximately $1.5 to $2 or Rs 60 to Rs 90 per kg (Rs 90,000 per tonne of dry pods, equivalent to). Hungarian paprika was available at $1.75 per pound of dry weight (450 gm), that is a tonne costs $3,500 to $4,000. Spanish paprika and Israeli paprika are available at around $3,000 to 3500 per tonne. A cheaper variety of Spanish paprika and Moroccan paprika costs between $2,000 to $2,500 per tonne:

Central and south western American countries and European nations are among the major growing countries.

Indian has now emerged as a potential country that can grow high quality paprika with the introduction of a high colour-chilli from Dharwad district of Karnataka, the Byadagi cultivars. This was found to have great prospects in the international market and has opened a new terrain in commercial agriculture. Today, 75 to 80 per cent of the global market needs are met form Europe and America.

The area and productivity is coming down in these countries and the demand for paprika is increasing. The only way out to meet the global demand for paprika is to bring new areas in tropical countries under cultivation. India has the most potential in that respect.

Economic Times *2001*

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Nilgiri's to start two fast-food chains, take flagship overseas

Nilgiri's is all set to unlock its 100 years-old brand value with forays into a string of new businesses in the domestic and international markets. It plans to launch a chain of Indian curry pizza outlets called the French Bread Pizza in Bangalore, Chennai and Hyderabad, apart from taking Nilgiris 1905-its original Indian cuisine restaurant-and Curry Bakes-the take away Indian snack kiosk -to international boundaries like the UK, Singapore and Malaysia. It also proposes to hit the market this summer with a range of handmade chocolates and heat-and -eat non-vegetarian dishes.

Nilgiri's director-technical Prabu Ramachandran told ET that hand made chocolates will spur future growth apart from branching out into eatery business in a big way. It plans to set up at least 40 ready-to-eat concept restaurants called Just Fry Ups in key metros in the South . The pilot project in Bangalore is doing well and Niligiri's now plans to take this further with 12 company-owned outlets, with the rest through franchise network, Mr Ramachandran said. The company will invest about Rs.1.2 crore in this venture.

The other brain-child of the company is the French Bread Pizza outlet, at least 12 of which will come up in a few months in Bangalore, Chennai and Hyderabad. Five company-owned outlets will be set up with a Rs 1 crore investment The rest will surface under the royalty sharing arrangement with franchisees. The chain will offer pizzas in two variants, deep pan and crusty, with 10-12 Indian curry spreads, plus six regular international varieties. The 1,000 sq ft pizza corners will have a wide distribution network to ensure that orders reach homes and offices across the city. The pizza will also be available as slices at the express counter at each of these outlets.

Niligiri's which offers 35 varieties of hand-made chocolates apart from 20 regular varieties, now proposes to unveil 12 products in the hand made category this summer including Praline, Cream Caramel, Sea Shells, Marzipan and Orange Jelly.

Niligiri's will introduce 40 special humidity controlled counters in stores like Food World in Bangalore, Mumbai, Delhi and Chennai, to offer its entire range of handmade chocolates. According to Mr Ramachandran, hand-made chocolates are slowly gaining in popularity and replacing conventional sweets gifts. For instance, in Mumbai, over 20 housewives are involved in making about 15-20 tonnes of hand-made chocolates a month.

Niligiri's does about Rs 150 crore of business, which it expects to push upto Rs.180 crore in 2001-02. This includes the chocolate segment which accounts for Rs.4.5 crore, and is targeted to triple to Rs.14 crore this year after the introduction of the new basket of chocolate products.

Economic Times *18-4-2001*

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New PFA Rules on Mineral Water

- New rules effective from March 29,2001.
- Water now classified as food.
- To be sold under BIS certification mark.
- 48 parameters set forth for manufacture and packaging.

According to an amendment to the Prevention of food Adulteration

Act (PFA), 1954, water is now classified as food. The amended rules will come into force from March 29,2001.

According to the amended rules, mineral water includes all kinds of mineral water or natural mineral water by whatever name it is called and sold. It should be sold under Bureau of Indian Standards (BIS) Certification mark.

Natural mineral water is clearly distinguished from ordinary drinking water because it is characterised by its content of mineral salts and their relative proportions and the presence of trace elements or other constituents.

The Government Order also distinguish between carbonated and uncarbonated mineral water, prescribes conditions for packaging mineral water and strictly prohibits carrying water in bulk containers from its source to distant packaging units.

The source of the mineral water should be protected against pollution and contamination.

The standards laid down are very rigid. The manufacturer is expected to test the mineral water at the source and if it is found polluted or contaminated, he should take corrective steps before resuming operations. The optimum and minimum levels of salts and trace elements are also prescribed. As many as 48 parameters have been set forth for manufacturers and packaging units.

The amendment also specifies standards for packing and selling ordinary potable water. Companies are required to print packaged drinking water, in bold letters enclosed in a box. Packaged drinking water has been defined as water derived from any source of potable water and subjected to treatments such as decantation, filtration, demineralisation, re-mineralisation and reverse osmosis before being packed. It may be disinfected using chemical agents and /or other physical methods, taking care not to alter its natural composition. It shall be packed in clean, sterile, colourless and transparent tamper-proof bottles and containers made of polyethylene, conforming to IS:10146 or polyviny1 chloride, conforming to IS:10151 or polylkylene terephthalate conforming to IS:12252 or polypropylene, conforming to IS:10910 or food-grade polycarbonate or sterile glass bottles.

Indian Food Industry March-April 2001

Industry Unhappy Over New Package Rules for Imported Goods

- CII voices concern on implementation of packaged commodities rules for imported goods.
- Interpretational problems and lack of clarity in implementation.

The Confederation of Indian Industry (CII) has pointed out in a statement, that the Directorate General of Foreign Trade (DGFT) notification of November 24 stipulating that all packaged products, which were subject to the provisions of Standards of Weights and Measures (Packaged Commodities)Rules of 1977 when produced/packaged /sold in domestic market, shall be subject to compliance of the provisions of the rules when imported into India, has resulted in the holding up of several consignments in various airports and ICDs. The customs authorities had implemented the provisions of the DGFT notification from January 1 and the situation was assuming alarming proportions with delay in clearance and increased demurrage charges, CII has pointed out that the DGFT notification has now made it mandatory to mark the imported prepackaged commodities with details such as the name and address of the importer, generic or common name of the commodity / article packed, net quantity packed, month and year of packing and the maximum retail price at which the commodity in packaged form may be sold to the ultimate customer.

While these stipulations are necessary for implementing the Packaged Commodities Rules and to check under-invoicing of goods, the chamber said the there were some practical difficulties for certain products to comply with the labelling requirements.

The chamber pointed out that due to lack of clarity in implementation aspects of the provisions, presently many interpretational problems have arisen.

Citing Rule 34, the chamber said that the rules provided certain exemptions but these were being interpreted differently by various customs authorities.

Indian Food Industry March-April 2001

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Mandatory Bar Coding of Exports Deferred

Earlier deadline of April 1,2001, indefinitely postponed.

Industry prefers voluntary bar coding for exports.

The earlier set dealing of April 1,2001, for implementing the mandatory bar coding of all exports from the country has been postponed yet again by the Central government.

The deadline of April 1,2001 was set in November 2000 after representations were received, by the Directorate General of Foreign Trade (DGFT), from the exporting community conveying the various difficulties faced by the trade and industry in adhering to the earlier set deadline of December 1,2000.

Sources said this time round, no specific deadline has been fixed for implementing the mandatory barcoding. The Commerce and Industry Ministry had on September 1,2000 issued a notification making the implementation of bar coding-using international symbols/ international numbering standard mandatory with effect from December 1,2000, in respect of exports of all finished and packaged items for retail sale.

Trade and industry have been coming up with different views on the implementation of mandatory bar coding in the country. While a section of exporters had been demanding that a 'reasonable extension' be accorded for the implementation of mandatory bar coding, some others felt that the Government should leave it to the exporters to decide for themselves whether bar coading should be adopted.

Indian Food Industry March-April 2001

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Process for Tenderizing Layer Chicken Muscles developed by CFTRI

Microbiologically safe tenderised layer chicken muscles.

The product used in the preparation of chunks in curry, chicken fry and other traditional meat products.

With about 200 million layer chicken population, India has a large potential for the preparation of value-added products from chicken meat to meet the growing demands of consumers. Meat from layer chicken is tough and has limited use in the preparation of only comminuted type of products.

This process has dual objective of improving the texture quality of layer chicken muscles and increase its demand for use in varieties of products. The process involves treatment of layer chicken carcasses with selected GRAS (generally recognised as safe) chemicals under optimised conditions. The process needs refrigeration system and stainless steel/plastic bins etc., and can be utilized by the existing poultry processing units for the preparation of varieties of convenience products.

The tenderised layer chicken muscles are microbiologically safe, can be packed in polyethylene bags and then chilled or frozen for marketing. The tenderised muscles require considerably less cooking time thus saving energy. The tenderised muscles can be used for the preparation chunks in curry, chicken fry and other traditional meat products.

For details on process know how, Plant layout and project economics, please contact Director, CFTRI, Mysore-570013.

Indian Food Industry March-April 2001

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MP exempts processed grains, pulses of commercial tax.

The Madhya Pradesh government has decided to exempt processed foodgrains and pulses from commercial tax. The Digvijay Singh government at a Cabinet meeting in Bhopal yesterday decided that no commercial tax would be levied on processed foodgrains and pulses, says an official release.

However, the government has decided to continue with the two per cent commercial tax on unprocessed foodgrains and pulses.

To prevent transfer of unprocessed foodgrains and pulses out of the state under the cover of processed food, the government has decided to go for an intensive checking at pulse mills and interstate checkposts.

Business Standard *20-4-2001.*

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Milk - based exports to be inspected

The central government has brought milk products for exports under compulsory pre-shipment inspection and certification following strict measures imposed by European Union and the US.Union minister of state for commerce and industry, Omar Abdullah, said on Tuesday exporters and food producers have greater access to international markets following the relaxation of QRs. However, exporters have to face new challenges in terms of quality and safety of their products, he said while inaugurating a two-day awareness programme on milk products certifications, requirements for exports, here-PTI

Economic Times *20-4-2001.*

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Food Safety Standards

22nd Session of Codex Committee on M ethods of Analysis and Sampling held in Budapest, Hungary during February 26,2001 to March 3,2001.

Dr S K Saxena, Director, FRAC, the Food Testing Laboratory of FICCI/ CIFTI attended the meeting.

The committee discussed:

- **Criteria for evaluating acceptable methods of analysis for Codex purposes :** It was decided the criteria approach would be applied to Type III methods and that only in the case of dispute situations Type II methods would be prescribed by the CCMAS, which was strongly supported by Indian Delegation.
- **Criteria for evaluating acceptable methods of analysis for codex purposes :** The committee agreed to forward the amendments to the "principles for the establishments of methods of analysis and relations between Commodity Committees and General Committee-Methods of analysis and sampling" to the Committee on General Principles for endorsement and to the 24th Session of the Commission for adoption and inclusion in the Procedural Manual.
- **Harmonised guidelines for the use of recovery information on analytical measurement:** The Committee had decided to endorse the IUPAC, ISO and AOAC international harmonised guidelines for the use of recovery information in the analytical measurements.
- **Harmonisation of analytical terminology in accordance with international standards:** Measurement limits: Committee agreed that there was no need for further consideration of measurement limits at this stage, and it might consider this issue again at a later date if needed.
- **Relationship between the analytical result, the measurement uncertainty and the specification in Codex Standards :** The committee welcomed the proposal of delegation of UK to prepare a discussion paper addressing the compliance aspects associated with measurement, uncertainty, recovery factors and sampling since these different issues were related. The issue will be considered in the next session of CCMAS.
- **In-house method delegation:** The Committee generally

recognised that single laboratory validation could be used for Codex purposes and agreed that the next session would consider the inclusion of a specific text in the Procedural Manual to that effect. It was also decided to prepare a paper on the validation of methods through the use of results from proficiency testing schemes as a separate issue.

- **Endorsement of methods of analysis provision in Codex Standards :** The report of adhoc working group on endorsement of methods of analysis was presented. The committee agreed to request the CCPFV to consider its earlier question concerning the draft standards for pickles while finalising the standards.
- **Committee decided to endorse the proposed methods and concluded that the method EN 1785 :** 1996 for detection of irradiated foods containing fat by GCMS as Type II mentioned for codex purposes.
- **Report of Inter-agency meeting of methods of analysis :** The draft report of 14th inter agency meeting was presented. Three new organisations (AOCS, NFPA & AOAC Research Institute) were accepted as new members.

COMMITTEE'S FUTURE WORK

- Proposed draft general guidelines on sampling.
- Proposed draft guidelines on measurement uncertainty.
- Consideration of guidelines for the use of criteria approach.
- Consideration of methods of analysis in dispute situations.
- Single laboratory validation.
- Methods of analysis for the detection and identification of GMOs.
- Methods of analysis and detection of Dioxins.
- Endorsement of methods in Codex standards.

The next session of CCMAS is tentatively scheduled to be held in Budapest in November 2002.

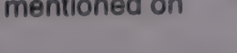
CIFTI Digest *March 2001*

14th Meeting of Analyst Sub-committee of CCFS

It was held on 11th January 2001 at Central Food Laboratory Calcutta, under the Chairmanship of Dr MN Krishnamurthy, Director, Central Food Laboratory-Mysore, Dr. S.K.Saxena, Director, FRAC, represented CIFTI in this meeting. The following decisions were taken:

- Standards of Pickle: Committee dicided that under the standards of pickles in oil (if mentioned on the label) the requirement of 0.5 cm layer of oil will be deleted as it is difficult to measure. However, requirement of minimum 10% oil will remain. Pickle may be treated as a proprietary item and ingredients may be mentioned on the label in descending order including oil content.
- Method for testing of Residue of Veterinary Drugs in Milk : Committee decided that under the Chairmanship of Dr Bawa, Director -DFRL and in co-ordination with NDRI, FRAC, CFL Calcutta & Mysore and Delhi PFA Laboratory, methods of analysis will be standardised. DGHS will provide the reference standards. In due course, these laboratories may be utilised to train other personnel of PFA laboratory.
- Method of sampling of Bulk Imported food articles :Committee decided that Dr S K Saxena, Director-Frac in co-ordination with CFL-Calcutta and Bureau of Indian Standards will provide a document on the above subject. Codex guidelines in this regard may also be taken into consideration.
- Review of fee for analysis of food articles under PFA Rules,1955 :Committee decided to adopt the proposed testing charges per sample by EIC for import inspection.

CIFTI Digest *Feb. 2001*



27th meeting of Label Sub-Committee of CCFS

The 27th Meeting of the Label the Sub-committee of CCFS was held on January 8,2001 at Nirman Bhavan, New Delhi under the chairmanship of Dr Kamala Krishnaswamy, Director, National Institute of Nutrition. Dr. K L Gaba, Chairman, CIFTI Food Additives & Labelling Committee, attended the meeting on behalf of CIFTI. The issues to be discussed during the meeting were: Adoption of Codex Guidelines for labelling of Foods under PFA Rules, Guidelines for the use of Health and Nutritional Claims, Classification of Dietary Supplement / Health and Nutritional Claims, Classification of Dietary Supplement /Health Foods/ Herbal Food/ Neutraceuticals etc. However, due to paucity of time the whole agenda could not be discussed and the adjourned meeting will again be held on 1st February.2001.

In the mean time the Committee constituted a smaller expert group under it to discuss the remaining issues in detail in order to streamline the Agenda for the next meeting, Expert group met on January 19, 2000.

CIFTI Digest *Feb 2001*

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IIHR Plan to raise Yield of Horticultural Crops

The Indian Institute of Horticultural Research (IIHR). Bangalore, one of the largest of its kind in Asia, has formulated a mission-oriented perspective plan for the coming two decades. The plan aims at keeping constant the percentage of cuernational markets. The institute would go in for a massive transfer of technology to the grassroots level so as to raise the productivity by 30-40 per cent over the next seven years. According to the Recommendatory Dietary Allowance (RDA) of the Indian Council for Medical Research (ICMR), the per capita consumption of fruits should be 120gm, which works out to about 42 million tonnes of actual production. Besides, the demand of the processing industry is about 8.5 m.t.and that of the affluent middle class is projected at 18 m.t. According to a study, the total demand has been projected in the region of 68.5 m.t. during 2000-2001 and at the current level of production of 46.97 m.t. there is a huge gap to be bridged. The institute had evolved maturity standards for a number of fruits. Methods for uniform ripening of fruits, their handling and storage, practices to extend shelf-life, preservation and packing have also been worked out of variety of fruits and vegetables. In the area of biotechnology, the institute had worked out protocols for micro propagation and mass multiplication of hortiltural corps such as banana, gladiolus, orchid and anthurium. Also , work is in progress on basic aspects such as genetic engineering molecular diagnostics, bio-fertilisers and bio-pesticides. The institute has so far released 26 improved varieties or hybrids in fruit crops such as mango, grapes, papaya, guava, litchi, acid lime, anona and pomegranate. In vegetables, 59 varieties/hybrids pertaining to 14 different crops have been released, of which 31 were at the national level and 28 at the State or institution levels.

CIFTI DIGEST *Feb.2001*

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Prospects of Organic Farming

Organic farming can help achieve sustainable yields and rejuvenate soil health. For instance in Argentina, the area under organic farming increased significantly from 5000 hectares in 1992 to 2.30 lakh hectare five years later in the country. Though India has achieved spectacular increase in food grain production, the yields in different crops have started to plateau due to excessive use of fertilisers and pesticides. Pesticide residues and fertiliser toxins have reached alarming levels, much above the permissible limits. Thus there is an urgent need to ban the use of harmful chemicals, pesticides and promote the use of biological control of pests for a safe environment.

CIFTI Digest *Feb 2001*

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INDUSTRY NEWS

Topical thirst quencher

Another Asian inspiration hits the shelves: the Star Fruit drink from Allswell Trading Pte Ltd.

A perennial favourite in the tropics, the refreshing qualities of starfruit or carambola are perfectly captured in the drink. Consumers will enjoy it on those scorching hot days, as a welcome alternative to carbonated drinks. Touted for your daily wellness, Allswell Starfruit Drink uses a traditional herbal system of double-boiling that blends the goodness of star fruit with mineral water, using no preservatives or added colouring. Every 100 ml of drink contains 42.71 kCal, 0.03g protein, 0.15g fat, 10.31g carbohydrate and 138 mg sodium.

Sold in 750 ml plastic bottles, Allswell Star Fruit drink is imported in Singapore by Allswell Trading Pte. Ltd.

Asia Pacific Food Industry *Jan-Feb.,2001*

☆ ☆ ☆

Herbal solution to high cholesterol

Magic Foods Sdn Bhd, manufacturer of Lassi yoghurt drink, presents Red Vine herbal beverage.

Different parts of the red vine plant (Vitis vinifera folium) have been used in various herbal preparations for millennia, and the last fifty years researchers have shown greater interest in its beneficial properties regarding the circulatory system.

Made from Swiss red vine extract, Redvine herbal beverage contains substantial quanities of polyphenols, anthocyanins and trans-reversatrol compounds. A proven cholesterol buster, the herbal formulation is scientifically prepared according to recommendations in French pharmacopoeia and based on hundreds of years of traditional usage.

Regular consumption of Red Vine is recommended for raising HDL (high density lipoprotein, or good cholesterol) levels and lowering LDL (low density lipoprotein, or bad cholesterol) levels. Red Vine also helps improve circulation and alleviate anal haemorrhoids (piles), varicose veins and edema.

In addition, RedVine herbal beverage contains inulin, a soluble vegetable fibre extract of the chicory root (Cichorium intybus L), which is generally accepted by nutritionists as a superior dietary fibre.

Asia Pacific Food Industry *Jan-Feb.,2001*

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Kraft ties up with Dabur

Kraft, the World's second largest food company, has entered into a tie up with Dabur for the distribution of its high volume products, beginning with its first brand in the country Tang, a fruit flavoured beverage. Beginning with Delhi, the product with be rolled out to over 20,000 outlets in Chennai, Mumbai, Hyderabad and Bangalore by the end of April this year.

According to the Dabur Foods CEO, Mr. Amit Burman, the partnership is based on compatibility and synergy. Tang complements Dabur's portfolio of products in the food market. "Our extensive reach and penetration in the retail universe will enable a quick roll out. We at Dabur are pleased to partner KJS in launching Kraft's first brand in India," he added.

Hindu *19-3-2001*

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Pepsi to export Rs 40-cr worth concentrates

Pespsi Foods Ltd expects to export Rs 40 crore worth of concentrate from its Channo plant in Punjab. The plant's second phase

was inaugurated here on Saturday by the Punjab Chief Minister, Mr Prakash Singh Badal.

Mr P.M.Sinha, President, Pepsi Foods, speaking at the inauguration of the plant, said the company had invested an additional Rs 22 crore in the plant and hoped to export Rs 40 crore worth of concentrates this year. He said this plant was rated among Pepsi's top three of the 13 concentrate plants world wide and added that it would supply the concentrate to about 50 plants both in India and abroad.

Pepsi Foods had annualised exports of Rs 300 crore, which included processed foods, basmati rice, guar gum and concentrate and the new facility opens up export opportunities to Russia and the South Asian market.

He further pointed out that the company had since its entry into the state in 1989 invested about Rs 150 crore across its three plants in Punjab. These businesses also employed about 800 people, he said.

The Channo plant also supports Pepsi Food's snacks line, including its Frito Lays brand of chips other namkeens as Lehar Kurkure.

Elaborating on the company's contract farming experiment, he said the research and development farm at Channo had yielded potato varieties that were low on sugar and high on solids. These seeds were, in turn, given to the contract growers who supply the potato to Pepsi's snack food plant. The company expects its entire requirement of potato to be sourced from contract farmers by the end of this year.

The company's contract farming experiments in groundnut, basmati and tomato were also achieving results, in terms of yield per acreage, on par with the rest of the world, he said.

Business Line *2.4.2001*

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United Kingdom : Heinz recall affected Tins

High levels of tin have been found by the Food Standards Agency, during a survey of canned fruit and vegetable products. The survery identified a problem with elevated levels of tin in samples of 400g can of Heinz canned spaghetti in tomato sauce. As a precaution Heinz are withdrawing certain batches of this product. Tin levels of over 200mg/kg have been found in some cans from the affected batches with the highest levels up to around 300 mg/kg. As there are health concerns regarding high concentrations of tin, the UK Tin in Food Regulations 1992 limit the maximum amount of tin in foods sold in the UK to 200 mg/kg. If canned spaghetti from the affected batches were easten, it could cause short-term stomach upsets or headaches in some people, but no long-term effects would be expected.

High concentrations of tin in food irritate the gastrointestinal tract and may cause stomach upsets in some individuals, with symptoms which include nausea, vomiting, diarrhoea, abdominal cramps, abdominal bloating, fever and headache. These are short term effects with recovery expected soon after exposure. These effects may occur in some individuals at tin concentrations above 200 mg/kg with an increased risk of effects at concentrations above 250 mg/kg. Long-term effects are not expected from tin in the diet. (See the Tomato News issue of January 2001)

Tomato News *March 2001*

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Del Monte to buy S & W Food Business for $41 million

Fruit and vegetable giant Del Monte Foods Co said recently it will acquire the S & W branded food business as well as related brands from Tri Valley Growers for approximately $ 41 million in cash. The company said it expects the acquistition, which it hopes to complete by March, to add approximately $ 100 million in sales and be profitable in the first full fiscal year. The company's fiscal year runs from July 1 to June 30. The S & W business, which includes canned fruits. tomatoes, dry bean items, The company's fiscal year runs from uly 1 to June 30. specialty sauces and vegetables.

became available through the Chapter 11 reorganization initiated by Tri Valley Growers in July 2000. No other Tri Valley assets are involved in the transaction, and Del Monte is not assuming any of Tri Valley's liabilites.

According to Richard Wolford, chairman and chief executive of Del Monete, this acquistion is consistent with Del Monte 's strategy to seek premium branded business that leverage the selling and operating infrastructure. S & W will result in significant cost synergies and will present top line growth opportunities.

The Contadina line of tomato products was Del Monte's first branded acquistion in 1997. In 1998 the company acquired rights to the Del Monte brand for processed products in South America. The Company will abhsorb S & W's businesses , including almost all production, into its existing operations. Sales and administration functions, including S & W 's international distribution, also will be folded into Del Monte's existing organizational structure. Del Monte believes this can be accomplished with minimal capital investment, yielding significant operational and administrative cost savings. Del Monte Foods Company, with net sales of approximately $1.5 billion in fiscal 2000, is the largest producer and distributor of branded processed fruit, vegetable and tomato products in the United States.

Tomato News *March 2001*

☆ ☆ ☆

Nestle and Coke venture into Health Drinks segment

- Aimed to tap into the 'new beverages' market
- Tea based drinks-iced tea products and iced coffee to be launched.
- Joint venture to be named Beverage Partners Worldwide.

Swiss Group Nestle SA and US giant Coca-Cola Co. would speed up efforts to tap into the booming 'new beverages' market, an area dominated by PepsiCo Inc and independent rivals. A joint venture company of the two biggest names in the food and drinks industry would launch new so-called health beverages and enter new markets. Such drinks include teabased drinks and follw the boom in supplying iced tea products. Iced coffee, already a success in Japan, can also be introduced in other markets.

An existing 50-50 joint venture will be renamed and be run as an independent entity from Nestle headqurters in Zurich.

On top of the venture's existing Nestea and Nescafe brands, Coca-Cola would add the Tina Yu Di and Yang Guang tea units while Nestle would add the Belte tea unit. The venture, currently named Coca-Cola and Nestle Refreshments (CCNR), will be renamed Beverage Partners worldwide (BPW).

BPW would function as an entrepreneurial unit dedicated to tapping the growth potential of emerging beverage segments, in particular ready -to-drink coffee, teas and beverage with a so-called healthful positioning, which include hearbal teas. CCNR is strong in the ready-to-drink tea category: With an increasesed brand range, BPW would have a volume base of 250 million cases.

Indian Food Industry March-April 2001

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Weikfield Agro to export more Mushrooms

- Tie-up with Franklin Mushroom Farms, USA.
- Rs 30 crore invested to manufacture 300 tonnes of mushrooms per month.
- 85% of its produce being exported to US and middle east.

Weikfield Agro Products Ltd is all set to export its 150th container of mushrooms to the US, from its 100 per cent export oriented unit (EOU).

Weikfield Agro has tied up with Franklin Mushroom Farms Inc, USA and is aiming to move to more value added products such as mushroom salads, sauces and marinates. The

first consignment of marinated mushrooms has already been exported to the US in February 2000. Weikfield has invested Rs 30 crore in an unit at Wagholi near Pune and set up across 32 acres of land and four lakh square feet of built up space with capacity to manufacture 300 tonnes of mushrooms per month.

The company has an international standard spawn laboratory, the only one of its kind, in the country.

It is exporting 85 per cent of its produce to the US and middle east market with the remaining being sold to institutional and retail segment in the domesic market under the Weikfield First Choice brand.

This year, the company is expecting a turnover of Rs 15 crore which is expected to more than double to Rs 35 crore in the next financial year.

Weikfield Agro has a processing and fruit division for manufacturing sauces, chutneys, processed fruits and vegetables.

These products have been launched in the Indian market under the Weikfiled brand and is also being supplied to the Patak group in the UK.

Indian Food Industry March-April 2001

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Nestle launches 'Pure Life'

- Nestle launches another popular bottled mineral water brand 'Pure Life'.
- Looking for an aggressive distribution network.
- It has 70 mineral water brands spread over 130 countries.

Nestle India Ltd. has launched 'Pure Life', its mass market bottled water, adding one more premium brand to the already saturated Rs 600 crore bottled water segment.

Priced at Rs 12, Pure Life is being bottled at the company's production unit at Samalkha in Haryana and has in its favour a proprietary bottle design, tamper-evident 3-D hologram seal mounted on the shrink sleeve. Pure Life is aimed at being No.2, within two years.

The company was looking at an aggressive distribution thrust both through conventional retail outlets and alternate trade routes like college canteens, railway stations and dhabas.

Recently, Nestle India had launched its Premium mineral water brand, Perrier and San Pellegrino, which were niche market products. The water division of the Nestle group has developed and acquired several successful brands of mineral water and processed water and has 70 brands in 130 countries.

Indian Food Industry March-April 2001

☆ ☆ ☆

Lemon flavoured Drinks likely to be launched by Cola Giants

- Coca Cola and Pepsi on an expansion spree of non-carbonated drinks.
- Owing to shifting away of consumers from carbonated soft drinks to new-age and health - related drinks.

Soft drink giants Coca-Cola Co, and Pepsi Co Inc may soon launch lemon flavoured versions of some of their colas.

Both beverage makers, the respective No.1 and No. 2 in the soft drink market, have been expanding their non-carbonated drink lineups in recent months in an ongoing effort to capture a greater share of consumers, who are shifting away from carbonated soft drinks towards new age and health-related drinks.

Pepsi-Cola, PepsiCo's soft drink unit, is currently determining whether to come out with Pepsi Twist, a cola mixed with lemon. Regular and diet versions of the drink were tested in various parts of Minnesota and Texas.

But while both companies have juice, sports drinks, bottled water and other such drinks to their line-ups, neither Coke nor Pepsi has launched a new national variety of a cola-flavoured carbonated soft drink through years.

According to Pepsi, its trademark drinks - Pepsi, Diet Pepsi and Pespsi One - had a Seven per cent volume gain during the summer in the 11markets where Pepsi Twist was tested. There was also a 25 per cent increase in awareness of the brand in those areas.

Pepsi Twist is not Pepsi-Cola's first version of lemon boosted cola, Pepsi Light, which was a diet beverage, was available in the US from 1975 through the mid 1980s.

It was a different drink other than the identically named Pepsi Light, which was the name of Diet Pepsi in certain international markets.

Indian Food Industry March-April 2001

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12 Plants to be set up for Aquafina

Pepsi Co to invest Rs 100 crore to set up 12 Aquafina plants.

Each plant to have manufacturing capacity of 160 bottles per minute.

One litre economy packs to be launched in addition to existing 750 ml packs.

Soft drinks major, PepsiCo, said it would invest Rs 100 crore to set up 12 plants for manufacturing its international purified, bottled water brand--Aquafina in India, in two phases of six plants each.

The company, which launched the brand in the country in July last year, planned to commission the first batch of six manufacturing plants by April this year. Each of the six plants, which would be commissioned this April, would have manufacturing capacity in the range of 160 bottles per minute. The plants would be set up in Bazpur and Kosi (Uttar Pradesh), Kolkata, W. Bengal, Roha in Maharashtra and in Bangalore in the first phase.

Aquafina was PepsiCo's premium water brand across the world, but it was not priced high in India. The company would soon launch one litre economy packs, apart from the 750 ml ones available at present.

Indian Food Industry March-April 2001

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Suiza to buy Dean Foods

Suiza Foods is buying Dean Foods for $1.5 billion in cash and stock in a deal that will create a dairy and specialty foods power house with about $10 billion in annual sales.

The combined company under the deal announced Thursday will be called Dean Foods, but it will be based in Dallas, where Suiza is headquartered. Suiza stockholders will own 65% of its shares.

The merger brings together two companies with complementary operations, products and distribution networks, and expands both Suiza's and Dean's geographic reach.

Dean Foods processes and distributes milk, ice cream and specialty products such as pickles, salad dressings and non-dairy coffee creamers under the Dean's brand as well as various regional brand names. Suiza processes and distributes dairy products under brand names that include International Delight, Second Nature, Naturally Yours, Mocha Mix and Sun Soy. "This opportunity should translate into increased consumption-a benefit for the entire industry, from dairy farmers to consumers," Suiza CEO Gregg Engles said.

Hindustan Times 6.4.2001

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HLL kicks off turnaround strategy for Modern Foods

Hindustan Lever Ltd (HLL) today claimed it has begun implementation of a comprehensive turnaround strategy of ailing Modern Foods Ltd (MFIL) even as the bread maker has been referred to the Board for Industrial and Financial Reconstruction (BIFR). An HLL spokesperson said : "Modern Foods has been referred to BIFR to comply with a mandatory regulation. But we have not sought any rehabilitation or relief from BIFR".

Claiming that since HILL took

over MFIL, the former has implemented a comprehensive turnaround strategy, he said HLL's turnaround strategy was focused on increasing sales, product quality, safety and hygiene, and employee training. "As a result of simultaneous initiatives on all fronts, the decline in sales, which has been going on over the previous three years- specially since the second half of 1999 - has been arrested. In fact, the going rate of sales has doubled in the last one year since the acquistion by HLL in 2000".

While he declined to reveal the financial health of MFIL, the spokesperson added it was mandatory for companies in India to notify the BIFR as soon as accumulated losses result in erosion of more than 50 per cent of the company's peak net worth in the preceding four financial years. As per an ANZ Investment Bank report of November last year, MFIL's net worth was expected to be eroded by about 33 per cent to Rs 24.19 crore between 1998 and 2000.

As per the ANZ report, HLL's business valuation of MFIL was over Rs 165 crore, but the consumer goods giant paid Rs 105.45 crore to the Government of India and Rs 20 crore was invested in MFIL for taking a 74 per cent stake. The spokesperson said, as part of the rehabilitation initiatives, formulations of all Modern breads have been improved by adding more ingredients and bread improvers; equipment has been upgraded while chilling plants have been repaired and baking tins replaced.

Business Standard *4-4-2001*

Lankan biscuit Co may shift to TN

A leading Sri Lankan biscuit manufacturer has threatened to move its operations to India amid growing labour unrest allegedly fanned by a radical leftist political party.

Ceylon Biscuits Limited (CBL), which operates a factory in Chennai, is considering shifting there to take advantage of lower operating costs because a trade union ordered employees not to work overtime to meet the company's local and export orders, press reports said.

The closure of CBL's local factory and its subsidiaries will result in a loss of over 1,000 jobs, company officials said. Press reports quoted CBL chairman M P Wickramasingha as saying that the demands made by the trade union affiliated to the leftist Janatha Vimukthi Peramuna (JVP) were intolerable.

"This is the time we have the highest demand for biscuits because of the Sinhalese and Tamil New Year. Apart from that, we have export orders to the US, West Asia and India," Wickramasigha said. "Our company's production has decreased by 50 per cent due to the trade union's activities, "he said.

Economic Times *13.4.2001*

Godrej Foods hopes to break even

A substantial reduction in distribution costs is expected to help the Rs 406-crore Godrej Foods Ltd to wipe out some of its losses incurred in the first three quarters of the 2000-2001 fiscal.

"We may just about break even as we have been able to reduce sales and distribution cost by as much as 50 per cent' said Mr M.P.Pusalkar, Executive Director, Godrej Foods Ltd.

Godrej Foods had terminated its marketing and distribution agreement with Godrej Pillsbury Ltd from November 1,2000.

Godrej Foods has been able to reduce sales and distribution costs considerably as it has adopted a different distribution system wherein the sales are carried out by consignment agents. "This system is used effectively in non-FMCG companies. We have discovered that this is a lean and cost effective method of distribution and there is a lot of improvement from commission agents and stockists," Mr Pusalkar said.

In this system, the company supplies to consignment agents against security deposit. Godrej Foods has appointed 25 commission agents who link up to 50 super stockists and 500 stockists across the country.

"Under this system, inventory

management is much better and the base from whom we collect money is much smaller," Mr Pusalkar said.

Distribution, which accounted for 9-10 per cent of sales, now accounts for 4-5 per cent of the sales.

Godrej Foods had reported a net loss of Rs 24.75 crore for the nine-month period ending December 31,2000 as against a net profit of Rs 1.61 crore in the year-ago period.

"Our focus for the next fiscal will be to consolidate our operations and employ cost-cutting measures across the board," Mr Pusalkar said.

However, the recent increase in customs duties on imports of edible oils is expected to keep margins under control. "Despite an increase in some of our edible oil products, we have been forced to absorb some of the cost as much of our oil is sourced through imports," he said. Besides, demand for edible oil is largely price-elastic.,

In the area of fruit processing, Godrej Fods is looking at increasing its capacity utilisation by seeking third party operations.

With an installed capacity of eight lakh trays per month (each try of 27 packs of 200 ml) for fruit drinks, Godrej Foods is aiming to use 50 per cent of its capacity.

Currently, the company's third party operation is confined to Maaza, Coca-Cola's mango drink.

At this juncture, the company was looking at the possibility of exporting mango pulp as it was already in the process of procuring and processing mango into pulp, Mr Pusalkar said.

Godrej Foods is expected to benefit marginally in its fruit drink business on account of the reduction of excise duty to zero level on processed fruit products in the Budget.

"What we save by way of excise duty will be spent in promoting our fruit drinks, Jumpin and Xs," Mr Pusalkar said, adding that fruit drink business accounted for just 20 per cent of the company's turnover.

Business Line *14.4.2001*

Parle enters dairy segment with 'N-Joy'

Parle Agro Ltd entered the dairy segment by launching a natural fruit and milk drink under the brand name "N-Joy" on Monday.

The company plans to roll out its first-ever dairy product in major metros, namely, Chennai, Pune and Mumbai to start with. Priced at Rs 15 for a 250 ml carton packed N-joy is positioned as a 100 per cent real mango and milk drink in the premium category informed Parle Agro chairman & managing director Prakash Chauhan.

With the launch of N-Joy, we have created a whole new category in the market place. Our new drink contains real alphonso mangoes and dairy fresh milk . There's no artificial flavour or colour like other dairy drinks. That 's our USP, he said.

With the tagline deliciously different, Parle's new launch will compete with other major players which include Nestle, Britannia (Milk Man) and Energy. Among others, the company will be completing the national roll out by May 15 this year. N-joy will be available across Parle Agro's five lakh retail outlets across cities. The initial launch of N-Joy will be available across cities. The initial launch of N-joy will be supported by POP material followed by a media blitzkrieg. After the national roll out, the company plans to introduce other variants, which include real strawberry, peach and pineapple in the next few months. According to Mr-Chauhan, the new product is targeted at the discerning consumer who wants a health drink which has real fruit and milk.

To announce the company's foray into the foray into the dairy segment, Parle Agro plans to launch an aggressive multi-media campaign within a month. Created by Everest Communications the media blitz will highlight the real natural contents of the drink in its communications.

The company has earmarked an ad budget of Rs 4 crore to promote the new launch in the next few months. Mr Chauhan said the

company will be launching the yoghurt variant of N-Joy very soon.

The company claims that it's for the first time an Indian company is offering a dairy product which has real fruit and milk. Prior to the launch of its new dairy drink, Parle Agro has carried out a nationwide research to know the reaction of people to its new launch. "The results showed 95 per cent purchase intent for our new product. After the launch of 250 ml we will roll out other pack sizes and bottles under N-Joy. For working adults, our new launch is an ideal health drink", added Mr Chauhan.

Parle Agro is a leader in the carton packed fruit drinks market with its leading brand "Frooti". The company also manufactures Bailley mineral water which is an established player in the western region. The company recently relaunched Frooti with much touted Digen Verma ad campaign.

Financial Express *17.4.2001*

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Low-cost sachets to spearhead Rasna's aggressive push into hinterland

Even as it prepares to guard the Rasna International market space from the re-entry of Tang, Rasna Enterprises is turning to the rural markets in order to push sales of its main product, Rasna soft drink concentrate (SDC). Says Rasna Enterprises president Raj Pinjani, "Earlier, we relied totally on our wholesalers to push the product in the rural areas. Now, we are going there ourselves in order to get a feel of the market and promote the product directly".

With increasing competition from the cola brands, which now have an established presence in take-home market, sales growth of the Ransa SDC has plateaued off in urban centres, especially Mumbai and Chennai. In order to promote trials in the new semi-urban and rural markets, Rasna launched the SDC in sachets seven years ago and today, sachet sales have grown to contribute 30 per cent of sales in terms of volume.

Targeted at the lower end segment, the sachets were promoted with a series of films made by B R Chopra, featuring characters from his Mahabharat television serial. This year, with the Mahabharat serial now forgotten and mythology fatigue having set in among television viewers, Rasna has dropped the original ads and is now using comedian Johnny Lever to promote the product .

Priced at Rs 5, the Rasna SDC sachet makes six glasses-as compared to the regular pack, which costs Rs 27.50 and makes 32 glasses-and is the main product in the company's rural marketing strategy. The company is focusing on nine districts in Maharashtra, Gujarat, Rajastan, Uttar Pradesh and Tamil Nadu, where its sales force regularly calls on retailers. It is also advertising the product in local cinemas, through wall paintings and on buses in the interior routes. Says Pinjani, "It's remarkable the amount of goodwill a visit to the rural distribution network can generate. It builds enormous brand loyalty among the retailers who, in turn, push sales to the consumer,"

Unlike Hindustan Lever -another company known for its success in rural marketing -Rasna does not have a wide basket of products, which makes its marketing efforts in the hinterlands more expensive on a per unit basis. The company is moving cautiously in the initial stages, using the nine districts as a pilot study to calculate returns on marketing investment before it expands the effort to more districts.

Meanwhile, Rasna International, the Company's more expensive product targeted at the urban adult market, is set to face renewed competition from the relaunched Tang brand from Kraft General Foods, which is now part of the Philip Morris Group. The international brand was earlier lanched in India by Kothari General Foods. But later withdrawn when it failed to notchup any worthwhile sales volumes. Says Pinjani, "We developed the market for this product category and we're sure Tang will have a hard time in establishing itself.'

Distributed in India by Dabur. Kraft 's Tang is imported from Thailand, which gives Rasna a cost advatage since import duties are high. Rasna International is priced at Rs 85 for a 500 gm sachet and Rs 105 for a bottle, while Tang is priced at Rs 100 for 500 gm. Here too, Rasna is using small sachets of 100gms, priced at Rs 20, to incduce trials.

Economic Times *17.4. 2001*

☆ ☆ ☆

Mc Donald's offers Indian menu in UK

If you thought it was only in India where international fast-food corporations adopted ethnic Indian recipes to attract local consumers, you are wrong. Mc Donald's has gone a step further by offering spicy Indian food at its outlets in England. In a bid to tap the British love of the Indian curry, this week Mc Donald's Corp is launching its "Spice of Life" range of Indian food. The new menu will be served at 1,000 restaurants for the next six weeks. A television campaign, developed by Leo Burnett, aims to attract consumers by depicting the "Britishness" of Indian curry. The campaign showcases the new, mouth watering dishes: Chicken Tikka Masala, Tandoori Chicken, Lamb Rogan Josh, Vegetables Samosas, Onion Bhajis and a Banana and Mango Cooler.

Business standard *18.4.2001*

☆ ☆ ☆

Wall's to open ice cream joints

It seems like ice cream lovers are in for some sweet times ahead. The 100 per cent subsidiary of HLL, Kwality Wall's has become aggressive with its plan to increase its share in the Rs 1,000 crore ice cream market. To this end, the company is launching branded parlours that would serve Kwality Wall's ice cream. As a pilot drive, it has already launched a few parlours, including one in South Delhi.

Interestingly, HLL is eyeing the Rs 30,000 crore impulse purchase market, which includes chocolates and biscuits too. Says an official spokesman of the company, "We do not want to restrict our base to just the ice cream market because that would stump our growth. Instead we are aiming to tap the entire impulse purchase market.

Which implies that our total market would increase substantially. For example, we have Biki Max which has a biscuit base," Apart from this, HLL is all set to bring out innovative flavours in its ice cream that cater particularly to the Indian palate. The company has already launched the *jal jeera* ice cream under the brand Feast, priced at Rs 7. That is not all. HLL'S spokesman says that the company would bring in more such ethnic flavours in summer, apart from launching more brands from its Unilever's international portfolio, especially, from its Magnum range of ice creams.

However, the going may not be very easy for HLL, especially because in the past few months, the ice cream segment has seen some major developments. International brands like Movenpick, Blue Bunny have already made an entry into the Indian market. Apart from that the south-based MTR Foods also launched its ice cream under the brand MTR, which has done well in the southern markets.

If sources are to be believed, the recent developments which include the adoption of the international logo and expansion of the product portfolio may be due to the company's falling market share in the ice cream segment. A market analyst however says that the company needs to improve its cold chain network to compete with players like Mother Dairy and Amul.

Business Standard *18.4.2001*

☆ ☆ ☆

Campbell to separate soup from sauce and beverage

Campbell Soup Co. the largest US soup maker, will reorganise its North American operations into two business units, hoping to revitalise its stagnant soup business by separating it from the beverages and sauces operations.

The realignment will put all of the company's North American soups, which are sold mainly under the Campbell's brand, into one unit, the company said. The second unit will consist of Campbell's beverage, sauce and prepared foods businesses, which include V8 and V8 Splash beverages and Pace and Prego sauces.

Both units will continue to be run from the company's Camden headquarters.

Campbell said Mr E. Martin Thrasher, 50, the President of Campbell North America, was leaving the company to pursue other career opportunities. Mr Andrew Hughson, 46, will become the President of the new North American soup division. The company said it was searching for someone to head North American beverages and sauces.

The Campbell President and Chief Executive, Mr Douglas R. Conant, said revitalising its North American soup business was Campbell's top priority . "This new organisational alignment is designed to sharpen our focus on consumer marketing and competitive strategies for soup" Mr Conant said.

He said the grocery brands V8 and V8 and V8 Splash juices, Prego Pasta Sauces, Pace Mexican sauces and Franco-American pastas, required a "heightened level of executive attention".

Mr John M. McMillin a food and beverage analyst with Prudential Securities, said the realignment was an acknowledgment by Campbell that it had to focus on some of its grocery brands. "Campbell has had some well-publicised problems in its soup business over the last few years. But its had even worse problems with brands such as Franco-American," Mr McMillin said. "This restructuring gives brands like Franco American some special attention."

Pepperidge Farm cookies and crackers, Godiva chocolates and the company's businesses in Europe and Asia will be unaffected by the realignment, the spokesman, Mr Jerry Buckley, said.

Business Line *17.4.2001*

Nilgiri's to start two fast-food chains, take flagship overseas

Nilgiri's is all set to unlock its 100-year old brand value with forays into a string of new businesses in the domestic and international markets. It plans to launch a chain of Indian curry pizza outlets called the French Bread Pizza in Bangalore, Chennai and Hyderabad, apart from taking Nilgiris 1905 - its original Indian cuisine restaurant and Curry Bakes the take-away Indian snack kiosk to international boundaries like the UK, Singapore and Malaysia. It also proposes to hit the market this summer with a range of handmade chocolates and heat and eat non-vegetarian dishes.

Nilgiri's director-technical, Prabu Ramachandran told ET that hand made chocolates will spur future growth apart from branching out into eatery business in a big way. It plans to set up at least 40 ready-to-eat concept restaurants called 'Just Fry Ups' in key metros in the South. The pilot project in Bangalore is doing well and Niligiri's now plans to take this further with 12 company-owned outlets, with the rest through franchise network, Mr. Ramachandran said. The company will invest about Rs. 1.2 crore in this venture.

The other brain-child of the company is the French Bread Pizza outlet, at least 12 of which will come up in a few months in Bangalore, Chennai and Hyderabad. Five company-owned outlets will be set up with a Rs. 1 crore investment. The rest will surface under the royalty sharing arrangement with franchises. The chain will offer pizzas in two variants, deep pan and crusty, with 10-12 Indian curry spreads, plus six regular international varieties. The 1,000sq ft pizza corners will have a wide distribution network to ensure that orders reach homes and offices across the city. The pizza will also be available as slices at the express counter at each of these outlets.

Niligiri's which offers 35 varieties of hand-made chocolates apart from 20 regular varieties, now proposes

to unveil 12 products in the hand-made category this summer including Praline Cream Caramel, Sea Shells, Marzipan and Orange Jelly.

Niligiri's will introduce 40 special humidity-controlled counters in stores like Foodworld in Bangalore, Mumbai, Delhi and Chennai, to offer its entire range of handmade chocolates. According to Mr Ramachandran, hand-made chocolates are slowly gaining in popularity and replacing conventional sweets gifts. For instance, in Mumbai, over 20 housewives are involved in making about 15-20 tons of hand-made chocolates a month.

Niligiri's does about Rs. 150 crore of business, which it expects to push upt to Rs. 180 crore in 2001-02. This includes the chocolate segment which accounts for Rs. 4.5 crore, and is targeted to triple to Rs. 14 crore this year after the introduction of the new basket of chocolate prodcts.

The Economic Times *18-04-2001*

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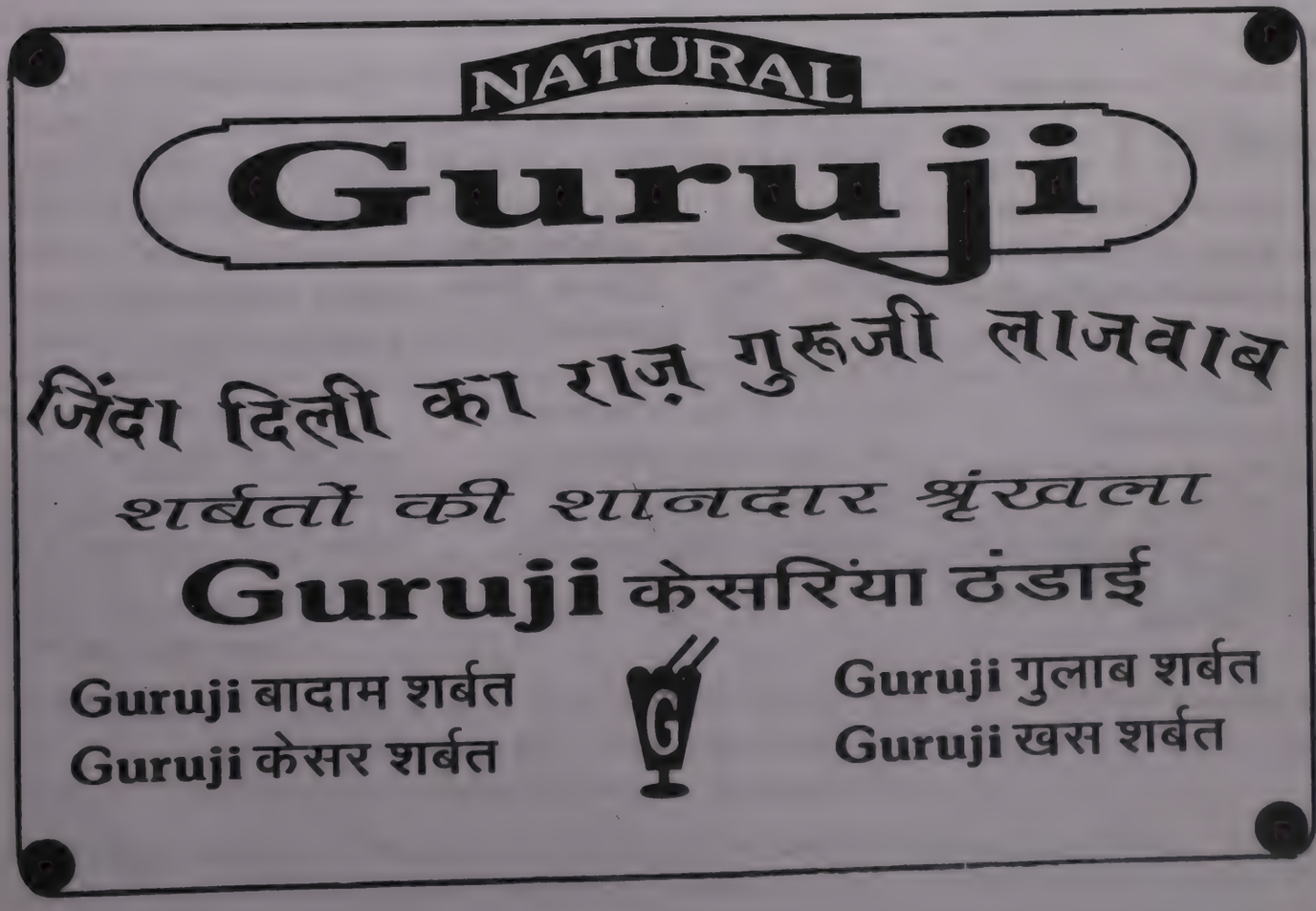

FAIRS & SEMINARS

National Seminar on "Managing Agri-Business in the New Millennium-Challenges and opportunities," June 29-30, 2001, Taj Mahal Hotel, New Delhi.

The All India Management Association is organizing the above Seminar to focus attention on this important field of Agri- Business. The Seminar Director is Dr Mruthunjaya, Director, National Centre for Agricl. Economics and Policy Research (NCAP) with a distinguished list of speakers.

Delegate fee is :

Rs 5,000/- for AIMA Members
Rs. 5,500/- for Non Members.
Rs. 3,000/- for R&D Institutes.

Contact :

Ms. Sujatha Khempa
Programme Incharge
All India Management Assn,
14, Institutional Area,
Lodhi Road, New Delhi-110003
Tel : 4635015, 4611672, 4617354
Fax : 4626689.

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3rd International Dairy & Food Technology Expo-2001, World Trade Centre, Mumbai, November 21-24,2001.

The 2nd IDFT Expo-2000 was held at Pragati Maidan, New Delhi during October 2000. This expo had been co-sponsored by All India Food Processors' Association.

The 3rd Expo is sponsored by DLG-German Agricultural Society and co-sponsored by All India Food Processors' Association and other reputed Associations.

Interested persons may contact: Tafcon Projects (India) Pvt.Ltd., C-60, Nizamuddin East, New Delhi -1100013
Tel : -91-11-4352141/44/82/84
Fax: -91-11-4355215/4354077
http://www.tafcon.com.
mailto:tafcon@del2.vsnl.net.in.

☆ ☆ ☆

Anuga with Anuga Spezial-The World's largest Food Fair

New parameters for Anuga: With a shorter duration and combination with the Anuga Spezial specialities forum, the largest and most important fair for the international food industry will open in autumn 2001.

Around 6,000 suppliers from 100 countries will present the world spectrum of food & drink exhibition.

An overview of the world food market presented by both the large, internationally operating producers as well as small manufacturers and specialised firms. Products Profile: Meat & Poultry, Frozen foods, Milk & Dairy products.

CIFTI proposes to take an official delegation to this event. Interested CIFTI members are requested to contact CIFTI Secretariat for further information.

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GOVT. CIRCULARS

Minutes of the first Meeting of the Working Group on Food Processing Industries Sector constituted by the Planning Commission for the Tenth Plan held on March 20, 2001

A short note on Food Processing Industries-current scene and prospects-was circulated during the meeting.

At the outset the Chairman welcomed the Members and explained briefly the importance Government attached to the food processing sector. It is acknowledged that this is a Sunrise Sector. On the production side in Agriculture tremendous developments have been made including introduction of new technology. However, processing level so far has been very low, some of the factors responsible for which are :

1. Byproducts not being utilized.
2. Processable quality of raw material not available.
3. Considerable wastage takes place.
4. Consumer pays a high price while the farmer gets very low return.
5. The benefits of technology are denied to the consumers.

It was also observed that around 52% of the working population is engaged in agriculture and allied activities whereas agriculture contributes only one-third of the GNP. Government's resolve is to do something positive in this direction. This is reflected by the Budget proposal for 2001-02 to bring down the represent excise duty of 16% to zero level for processed fruits and vegetables. This is expected to create a conducive environment for large investments. DEPI in its proposed National Policy on Food Processing Industries envisages a vision of increasing the level of processing from 2% to 10% over a period of 10 years and ultimately to 25%. Government's efforts would have to be supplemented. More emphasis needs to be placed on value addition and increased volumes. Budgetary provisions being very meagre, they have to be properly leveraged to get maximum advantage for this sector.

Shri B.D.Jethra, Adviser, Planning Commission agreed with the view of the Chairman and suggested that the Working Group should come with recommendation for appropriate steps to be taken for increasing the processing level, which would create more employment, enhance exports and benefit both farmers and consumers. Analysis of what has been achieved during the Ninth Plan and what should be done for the future may be attempted.

Shri N.K.Maini, Chief General Manager, SIDBI informed the Group that SIDBI has made available around Rs. 1000/- crore during the last three years to the small scale sector. Assistance provided for includes branding of products, and marketing inputs. Loans are given on commercial terms.

Dr. V.Prakash, Director, CFTRI desired that an Action Plan be drawn up for modernization of industries, upgradation of Research & Development, Technology transfer etc. More emphasis could be placed on primary processing, extension of shelf life. Incremental value addition needs to be highlighted because in a low capital,

low technology regime this is the arrangement that will best suit processing and will also help in by-product utilization. Training programme could be organized to promote skilled labour. Local fabrication of new technology and equipment which will bring down costs is another area that can be concentrated upon.

Shri Gokul Patnaik emphasized the need to tackle marketing problems, reduce wastage, develop new products, harmonize laws, and extend facilities for creation of infrastructure, preservation and storage.

Shri R.S.Prasad, Jt. Secretary & Financial Adviser was of the view that a Technology Mission approach be adopted. As there are many agencies working on different aspects, networking of all those would be beneficial. DFPI should concentrate its efforts on processing.

Shri J.Tharakan was of the view that incentives should be provided to the private sector for enabling investment in the sector. Low import duty, excise duty exemption for a longer period of time for branded products etc. should be attempted. The domestic base should be strengthened so that exports can also be enhanced.

Summing up the deliberation, Chairman requested Members to form the sub-Committees on the following aspects:

(i) Packaging in Food Processing Industries.
(ii) Product Development, Food Standards & Promoting Innovation.
(iii) Cold Chain & Intervention for improving shelf life.
(iv) Fruit and Vegetable Processing : Facilitating increased investment, financial needs etc. in the wake of Excise rebate.
(v) Meat Processing - Challenges in post WTO
(vi) Marketing including end-to-end linkages-facilitation.
(vii) Public-private partnership.
(viii) North-East & Tribal areas.

Some of these could be clubbed together.

These sub-Committees should submit their reports keeping in view the terms of reference detailed in the Communication No. VSI/9(40)2001 dated 12.02.2001 of the Planning Commission within there months to the Working Group for its consideration

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MINISTRY OF HEALTH AND FAMILY WELFARE

(Department of Health)

NOTIFICATION

New Delhi, the 4th April, 2001

G.S.R.245(E)-Wheareas the draft of certain rules further to amend the Prevention of Food Adulteration Rules, 1955 were published as required by sub-section (1) of section 23 of Prevention of Food Adulteration Act, 1954 (37 of 1954) in the notification of Government of India in the Ministry of Health and Family Welfare (Department of Health)number G.S.R. 775(E) dated the 6th October, 2000 in the Gazette of India, Extraordinary, part II, Section 3, Sub-section (i), dated the 6th October, 2000 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of a period of twenty one days from the date on which copies

of the Official Gazette containing the said draft rules were made available to the public;

And whereas the copies of the said Official Gazette were made available to the public on 9th october, 2000;

And whreas the objections and suggestions received from the public on the said draft rules have been considered by the Central Government,

Now, therefore, in exercise of the powers conferred by sub-section (1) of section 23 of the said Act, the Central Government, after consultation with the Central Committee for Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, Namely:

RULES

1. (I) These rules may be called the Prevention of Food Adulteration (Fourth Amendment)Rules, 2001.

   (II) They shall come into force after six months from the date of its publicaiton in the official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955,-

   (I) In rule 32,-

   (II) In clause (b), after the second proviso, the following proviso shall be inserted namely:-

   "Provided also that when any article of food contains whole or part of any animal including birds, fresh water or marine animals or eggs or product of any animal origin, but not including milk or milk products, as an ingredient,-

   (A) A declaration to this effect shall be made by a symbol and colour code so stipulated for this purpose to indicate that the product is Non-Vegetarian Food. The symbol shall consist of a brown colour filled circle having a diameter not less than the minimum size specified in the Table given below, inside the square with brown outline having side double the diameter of the circle, as indicated in clause (16) of sub-rule (ZZZ) of rule 42;

Table

S.,No.	Area of principal display panel	Minimum size of diameter in mm
1	Upto 100 cms square	3
2	Above 100 cms square upto 500cms square	4
3.	Above 500cms square upto 2500 cms square	6
4.	Above 2500 cms square	8

(b) The symbol shall be prominently displayed,-

(i) On the package having contrast background on principal display panel,

(ii) Just close in proximity to the name or brand name of the product, and

(iii) On the labels, containers, pamphlets, leaflets, advertisements in any media;

Provided also that where any article of food contains egg only as Non-Vegetarian ingredient, the manufacturer; or packer or seller may give declaration to this effect in addition to the said symbol.

Provided further that the provisions of these rules shall not apply in respect of any Non-Vegetarian Food which is manufactured and packed without the symbol before the commencement of the Prevention of Food Adulteration (Fourth Amendment)Rules, 2001.

(B) After Explantion VIII, the following Explanation shall be inserted, namely:-

Explanation IX - "Non-Vegetarian Food" means an article of food which contains whole or part of any animal incldiuing birds, fresh water or marine animals or eggs or products of any animal origin, but not including milk or milk products, as an ingredient. "

(II) In rule 42, in sub-rule (ZZZ), after clause (15), the following shall be inserted, namely:-

"(16) Every package of Non-Vegetarian Food shall bear the following symbol on the principal display panel just close in proximity to the name or brand name of food namely :-

"

[No. P. 15014/12/99-PH (Food)]

Deepak Gupta, Jt. Secy.

Note : The Prevention of Food Adulteration Rules, 1955 were published in Part II, Section 3 of Gazette of India vide S.R.O. 2105 dated 12-9-1955 and were last amended vide G.S.R. No. 165(e) dated 7.3.2001.

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PRESS INFORMATION BUREAU
GOVERNMENT OF INDIA
BIS CERTIFICATION FOR PACKAGED WATER FROM JUNE 30

New Delhi, Chaitra 19, 1923

April 9,2001

The Ministry of Health and Family Welfare has issued two notifications amending provisions of the Prevention of Food Adulteration (PFA) rules to amend the existing standards for mineral Manufacturers were also required to obtain the certification from the Bureau of Indian Standards (BIS) so that it could be assured that the water being manufactured or packed was being done in hygienic conditions and to ensure proper quality control. This notification was to come into effect on March 29, 2001. Many companies have applied to the Bureau of Indian Standards for such certification. Since the process of certification could not be completed, the Department of Consumer Affairs requested that the time may be extended to enable this process to be completed. Therefore, the State Governments have been advised not to take action against any manufacturer who had already applied before the due date to the BIS for certification for which a period up to June 30, 2001 has now been given. Such applicants can continue to supply water meeting new standards up to June 30, 2001. A six month period has been given for products which may have been in the market before March 29, 2001.

MINISTRY OF HEALTH AND FAMILY WELFARE

(Department of Health)

NOTIFICATION

New Delhi, the 26th April, 2001

G.S.R.297(E).-Where as certain draft rules further to amend the Prevention of Food Adulteration Rules were published as required by sub-section (1), of section 23 of the Prevention of Food Adulteration Act, 1954 (37 of 1954), in the notification of Government of India, in the Ministry of Health and Family welfare (Department of Health), number G.S.R.464(E), dated the 17th May, 2000 in the Gazette of India, Extraordinary, Part II, section 3, Sub-section (i), dated the 17th May, 2000 inviting objections and suggestion from the persons likely to be affected thereby before the expiry of a period of sixty days from the date on which copies of the Gazette of India in which the said notification was published, were made available to the public,.

And whereas, the copies of said Gazette of India were made available to the public on the 19th May, 2000;

And whereas, the objections and suggestion received from the public on the said draft rules have been considered by the Central Government.

Now, therefore, in exercise of the powers conferred by section 23 of the said Act, the Central Government, after consultation with the Central Committee for Food Standards, hereby makes the following rules further the amend the Prevention of Food Adulteration Rules, 1955, namely:-

1. (1) These rules may be called the Prevention of Food Adulteration (5th Amendment)Rules, 2000.

(2) These shall come into force after six months from the date of their publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955, in Appendix 'B' after item A 18.12, the following shall, be inserted, namely :-

"A 18.12.01-MALT BASED FOODS (MALT FOOD) means the product obtained by mixing malt (wort or flour or malt extract) of any kind obtained by controlled germination of seeds (cereals and / or grain legumes), involving mainly steeping germination and kiln drying processes with other cereal and legume flour with or without whole milk or milk powder, flavouring agents, spices, emulsifying agents, eggs, egg powder, protein isolates, protein hydrolysates; edible common salt, liquid glucose, sodium or potassium bicarbonate minerals, amino acids and vitamins It may contain added sugar and /or cocoa powder and processed in such a manner to secure partial or complete hydrolysis of starchy material in the from of powder or granules or flakes by drying or by dry mixing of the ingredients. The grains, legumes and their products used preparation of malt shall be sound uninfected and free from insect fragments, rat excreta, fungal infested grains or any other type of insect or fungal damage.

It shall also conform to the following standards, namely:-

(a) Moisture	-Not more than 5 per cent, by weight.
(b) Total Protein (N X 6.25) (on dry basis)	-Not less than 7.0 per cent, by weight.
© Total ash (on dry basis)	-Not more than 5 per cent, by weight.

(d) Acid insoluble ash (in dilute HCl).	-Not more than 0.1 per cent, by weight.
(e) Total plate count	-Not more than 50,000 per gram.
(f) Coliform count	-Not more than 10 per gram.
(g) Yeast and Mould Count	-Not more than 100 per gram.
(h) *E Coil*	-Absent in 10 gram.
(i) *Salmonella* and *Shigella*	- Absent in 25 gram
(j) Alcoholic Acidity (Expressed as H_2SO_4) with 90 per cent alcohol (on dry weight basis)	-Not more than 0.30 per cent.

[No.P-15014/13/99-PH(Food)]

DEEPAK GUPTA, Jt Secy.

Foot Note. - The Prevention of Food Adulteration Rules, 1955 were published in Part II, Section 3 of Gazette of India vide S.R.O.2105 dated 12.9.1955 and were last amended vide G.S.R.145(E) dated 4.4.2001.

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MINISTRY OF HEALTH AND FAMILY WELFARE

(Department of Health)

NOTIFICATION

New Delhi, the 4th January,2001

G.S.R.7 (E)-Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955 were published as required by sub-section (1) of section 23 of the Prevention of Food Adulteration Act, 1954 (37 of 1954) in the notification of Government of India in the Ministry of Health and Family Welfare (Department of Health) number G.S.R.693 (E), dated the 11th October, 1999 in the Gazette of India, Extraordinary, Part II, Sections 3, Sub-section (i), dated the 11th October, 1999 inviting objections and suggestions from the persons likely to be affected there by before the expiry of a period of sixty days form the date on which copies of the Gazette of India in which the said notification was published, were made available to the public;

And whereas the copies of the said Gazette of India were made available to the public on the 12th October, 1999;

And whereas the objections and suggestions received from the public on the said draft rules have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by section 23 of the said Act, the Central Government, after consultation with the Central Committee for Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, namely :-

1. (1) These may be called the Prevention of Food Adulteration (1st Amendment) Rules, 2001.
(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955 (hereinafter referred to as the said rules), in rule 50, in the first proviso, for the words and figure, "vanaspati covered under the Vegetable Oil Products (Control) Order, 1947," following shall be substituted, namely :-
"Vanaspati covered under Vegetable Oil Products (Regulation)Order, 1998."

3. Rules 67 and 69 of the said rules shall be omitted.

4. In Appendix B to the said rules,-

(i) in item A.18-01-02, for the words "Soya flour which is a solvent extracted flour used in such mix shall conform to the standards of soya flour laid down under Solvent Extracted Oil, De-oiled Meal and Edible Flour (Control) Order 1967", the following shall be substituted, namely :-

"Soya flour which is a solvent extracted soya flour used in such mix shall conform to the standards of soya flour laid down under item A.18.15".

(ii) After item A.18.14, the following shall be inserted namely: -

"A 18.15-SOLVENT EXTRACT SOYA FLOUR means the product obtained from clean, sound, healthy soyabeans by a process of cracking, dehulling, solvent extraction with food grade hexane and grinding. It shall be in the form of coarse or fine powder or grits, white to creamy white in colour, of uniform composition and free from rancid and objectionable odour, extraneous matter, insects, fungus, rodent hair and excreta. It shall be free from any added colour and flavour. It shall conform to the following standards, namely :-

(a) Moisture-Not more than 9.0 per cent by weight.
(b) Total ash- Not more than 7.2 per cent by weight on dry basis.
(c) Ash insoluble-in dilute HCL-Not more than 0.4 per cent by weight on dry basis.
(d) Protein (Nx 6.25)- Not less than 48 per cent by weight on dry basis.
(e) Crude fibre- Not more than 4.2 per cent by weight on dry basis.
(f) Fat- Not more than 1.5 per cent by weight on dry basis.
(g) Total bacterial-Count -Not more than 50,000 per gm.
(h) Coliform bacteria- Not more than 10 per gm.
(i) Salmonella Bacteria- Nil in 25 gm
(j) Hexane (Food grade)-Not more than 10.00 ppm.

(A.18.15.01-SOLVENT EXTRACTED GROUNDNUT FLOUR) means the product obtained from fresh, clean, degermed groundnut kernels which have been declutched after mild roasting. The kernels shall be first expelled followed by solvent extraction with food grade hexane or by direct extraction of kernels. It shall be whitish to light brown in colour of uniform composition and shall b e free from rancid an objectionable odour, extraneous matter, insect, fungus, rodent hair and excreta. It shall be free from added colour and flavour. It shall conform to the following standards namely :-

(a) Moisture- Not more than 8.0 per cent by weight.
(b) Total ash - Not more than 5.0 per cent by weight on dry basis.

(c) Ash insoluble in dilute HCl -Not more than 0.38 per cent by weight on dry basis.
(d) Protein (Nx6.25)-Not less than 48 per cent by weight on dry basis.
(e) Crude fibre-Not more than 5.0 per cent by weight on dry basis.
(f) Fat-Not more than 1.5 per cent by weight on dry basis.
(g) Total bacterial Count-Not more than 50,000 per gm.
(h) Coliform bacteria- Not more than 10 per gm.
(i) Salmonella bacteria-Nil in 25gm
(j) Hexane (Food grade)-Not more than 10.00ppm.

A.18.15.02-(SOLVENT EXTRACTED SESAME FLOUR) means the product obtained by pressing, clean, sound, healthy and decuticled sesame seeds followed by solvent extraction with food grade hexane or by direct extraction of kernels. It shall be in the form of flour of white or pale creamy white colour, of uniform composition and free from rancid and objectionable odour, extraneous matter, insects, fungus, rodent hair and excreta. It shall be free form added colour and flavour. It shall conform to the following standards, namely:-

(a) Moisture- Not more than 9.0 per cent by weight.
(b) Total ash- Not more than 6.0 per cent by weight on dry basis.
(c) Ash insoluble in dilute HCl-Not more than 0.15 per cent by weight on dry basis.
(d) Protein (Nx6.25) - Not less than 47 per cent by weight on dry basis.
(e) Crude fibre- Not more than 6.0 per cent by weight on dry basis.
(f) Fat-Not more than 1.5 per cent by weight on dry basis.
(g) Total bacterial Count - Not more than 50,000 per gm.
(h) Coliform bacteria - Not more than 10 per gm.
(i) Salmonella bacteria-Nil in 25gm.
(j) Oxalic Acid content- Not more than 0.5 per cent by weight on dry basis.
(k) Hexane (Food grade)- Not more than 10.00 ppm

A.18.15.03-(SOLVENT EXTRACTED COCONUT FLOUR) means the product obtained from fresh coconut Kernels or dried coconut copra of good quality and free from mould. Food grade hexane shall be used for extraction of the oil. It shall be of white or pale brownish yellow colour, of uniform composition and free from rancid and objectionable odour, extraneous matter, insects, fungus, rodent hair and excreta. It shall be free from added colour and flavour. It shall conform to the following standards, namely:-

(a) Moisture-Not more than 9.0 per cent by weight.
(b) Total ash - Not more than 6.0 per cent by weight on dry basis.
(c) Ash insoluble in dilute HCl-Not more than 0.35 per cent by weight on dry basis.
(d) Protein (Nx6.25)-Not less than 22.0 per cent by weight on dry basis.
(e) Crude fibre-Not more tan 9.0 per cent by weight on dry basis.
(f) Fat-Not more than 1.5 per cent by weight on dry basis.
(g) Total bacterial Count -Not more than 50,000 per gm.
(h) Coliform bacteria - Not more than 10 per gm.
(i) Salmonella bacteria-Nil in 25 gm.
(j) Hexane (Food grade) - Not more than 10.00ppm

A.18.15.04 :- (SOLVENT EXTRACTED COTTON SEED FLOUR) mesas the product obtained by solvent extraction of oil with food grade hexane from oil cake immediately following the single pressing, from cotton seed of good quality which have been pre-cleaned and are free from infected or otherwise damaged materials and extraneous matter. It shall be in the form of flour of white or plate brownish colour, of uniform composition and free from rancid and objectionable odour, extraneous matter, insect, fungus, rodent hair and excreta. It shall be free from added colours and flavours. It shall conform to the following standards, namely: -

(a) Moisture-Not more than 8.0 per cent by weight.
(b) Total ash - Not more than 5.0 per cent by weight on dry basis.
(c) Ash insoluble in dilute HCl-Not more than 0.35 per cent by weight on dry basis.
(d) Crude Protein (Nx6.25)-Not less than 47 per cent by weight on dry basis.
(e) Available Lysine-Not less than 3.6 g.per 100g.of crude protein.
(f) Crude fibre -Not more than 5.0 per cent by weight on dry basis.

(g) Free gossypol-Not more than 0.06 per cent by weight on dry basis.
(h) Total gossypol- Not more than 1.2 percent by weight on dry basis.
(i) Fat -Not more than 1.5 per cent by weight on dry basis.
(j) Total bacterial Count-Not more than 50,000 per gm.
(k) Coliform bacteria-Not more than 10 per gm.
(l) Salmonella bacteria-Nil in 25 gm.
(m) Hexane (Food grade)-Not more than 10.000 ppm,"

DEEPAK GUPTA. Jt. Secy.

Foot Note : - The Prevention of Food Adulteration Rules, 1955 were published in Part II, Section 3 of Gazette of India vide SRO 2105 dated 12th September, 1955 and were last amended vide GSR No. 876(E) dated 20-11-2000.

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MINISTRY OF HEALTH & FAMILY WELFARE

(Dept of Health)
NOTIFICATION
Dated 16th May, 2001

G.S.R.358(E).-The following draft of certain rules further to amend the Prevention of Food Adulteration Rules, 1955 which the Central Government without consultation with the Central Committee for Food Standards, proposes to make, in exercise of the powers conferred by sub-section (1) and its proviso, and read with sub-secton(1-A) section 23 of the Prevention of Food Adulteration Act, 1954 (37 of 1954), is hereby published as required by the said sub-section (1), for the information of all persons likely to be affected thereby, and notice is hereby given that the said draft rules will be taken into consideration after the expiry of period of thirty days from the date on which the copies of the Official Gazette in which this notification is published are made available to the public;

Any objection or suggestion which may be received from any person with respect to the said draft rules within the period specified above will be considered by the Central Government;
Objections or suggestions, if any, may be addressed to the Secretary, Ministry of Health and Family Welfare, Government of India, Nirman Bhavan, New Delhi - 110 011.

DRAFT RULES

1. (1) These rules may be called the Prevention of Food Adulteration (_____Amendment) Rules, 2001.
(2) They shall come into force after six months from the date of its final publication in the official Gazette.
2. In the Prevention of Food Adulteration Rules, 1955,-
(i) in rule 32,-
(A) in clause (b), after the third proviso, the following provisos shall be inserted, namely:-
"Provided also that for all Vegetarian Food,-
(a) a declaration to this effect shall be made by a symbol and colour code so stipulated for this purpose to indicate that the product is Vegetarian Food. The symbol shall consist of a green colour filled circle, having a diameter not less than the minimum size specified in the Table given below; inside the square with green colour outline having side double the diameter of the circle, as indicated in clause (17) of sub rule (ZZZ) of rule 42;

TABLE

S.No.	Area of principal display panel	Minimum size of Diameter in mm
1.	Upto 100cms square	3
2.	Above 100 cms square upto 500 cms square	4
3.	Above 500 cms square upto 2500 cms square	6
4.	Above 2500 cms square	8

(b) the symbol shall be prominently displayed,-

(i) on the package having contrast background on principal display panel,
(ii) just close in proximity to the name or brand of the product, and
(iii) on the labels, containers, pamphlets, leaflets, advertisements in any media;
Provided further that the provision of these rules shall not apply in respect of any Vegetarian Food which is manufactured and packed without the symbol before the commencement of the Prevention of Food Adulteration (Amendment) Rules, 2001.";

(B) After Explanation IX, the following Explanation shall be inserted, namely:-
'**Explanation X** - "Vegetarian Food" means any Food other than the Food defined under Explanation IX of this rule";-

(ii) in rule 42, in sub-rule (ZZZ), after clause (16), the following clause shall be inserted, namely:-

"**(17)** every package of Vegetarian Food shall bear the following symbol in green colour on the principal display panel just close in proximity to name or brand name of the Food, namely:-

"

sd/-
(Deepak Gupta)
Jt. Secy.

DUTY DRAWBACK RATES EFFECTIVE FROM 7th June 2001.

Serial/ Sub-Serial No.	*Description of goods*	*Rate of Drawback*	*Allocation Cus.*	*C.Ex.*
	CHAPTER - 7			
	Edible Vegetables Roots and Tubers			
	When CENVAT facility has Not been availed:-			
07.01	(a) Packed in OTS Cans.	Rs. 13.50 (Rs. Thirteen and paise fifty only) per kg. of the net weight of empty containers.	9.00	4.50
07.02	(b) Packed in Aseptic Bag kept in M. S. drums.	Re.0.90 (Paise ninety only) Per kg. of the net content.	0.40	0.50
07.03	(c) Packed in Glass Bottles	Re.0.80 (Paise eighty only) per kg.of net content	All C. Excise	
	When CENVAT facility has been availed :-			
07.04	(a) Packed in OTS Cans.	Rs. 9.00 (Rs. nine only) per kg. of the net weight of empty containers.	All Customs	
07.05	(b) Packed in Aseptic Bag kept in M.S. drums.	Re. 0.50 (Paise fifty only) per kg.of net content.	All Customs	
	CHAPTER - 8			
	Edible Fruits and Nuts, Peel of Citrus Fruit or Melons			
	When CENVAT facility has not been availed :-			
08.01	(a) Packed in OTS Cans.	Rs 13.50 (Rs. thirteen and paise fifty only) per kg. of the net weight of empty containers.	9.00	4.50
0.8.02	(b) Packed in Aseptic Bag kept in M S drums	Re 0 90 (Paise ninety only) per kg of the net content	0.40	0.50
08.03	(c) Packed in Glass Bottles	Re 0 80 (Paise eighty only) per kg.of net content.	Al C.Excise	

CHAPTER - 20
Preparation of Vegetables, Fruits, nuts or other parts of Plants

	Fruits, Pulps/fruit juice, fruit preparation, including mango/guava juice/pulps and their concentrates			
	When CENVAT faclity has not been availed :-			
20.01	(a) Packed in OTS Cans.	Rs. 13.50 (Rs. thirteen and paise fifty only) per kg. of the net weight of empty containers.	9.00	4.50
20.02	(b) Packed in Aseptic Bag kept in M.S.drums	Re.0.90 (Paiae ninety only per kg. of the net content.	0.40	0.50
20.03	(c) Packed in Glass Bottles.	Re. 0.80 (Paise eighty only) per kg. of net content.	All C. Excise	
	When CENVAT facility has been availed :-			
20.04	(a) Packed in OTS Cans.	Rs. 9.00 (Rs.nine only) per kg. of the net weight of empty containers.	All Customs	
20.05	(b) Packed in Aseptic Bag kept in M.S. drums.	Re. 0.40. (Paise forty only) per kg.of the net content.	All Customs	
	Fruit Jams.			
	When CENVAT facility has not been availed:-			
20.06	(a) Packed in OTS Cans.	3.6% (three point six per cent. only of FOB value	3.3%	0.3%
20.07	(b) Others	1.7 (one point seven per cent. only of FOB value	1.4%	0.3%
	When CENVAT facility has been availed :-			
20.08	(a) Packed in OTS Cans.	3.3% (three point three per cent only) of f.o.b. value	All Customs	
20.09	(b) Others	1.4% (one point four per cent only) of f.o.b. value	All Customs	
	C. Fruit products,not otherwise specified manufacturedm packed, marked and labelled, in accordance with Fruit Products Order, 1955, as amended from time to time, and the rules and regulations, made there-under or as per buyer's specifications, duly approved by the Licensing Officer of the Director (F&VP), (Deptt. of Food, Govt. of India).			
	When CENVAT facility has not been availed :-			
20.10	(a) Packed in OTS Cans.	Rs. 13.50 (Rs.thirteen and paise fifty only) per kg.of the net weight of empty containers.	9.00	4.50
20.11	(b) Packed in Aseptic Bag kept in M.S. drums.	Re. 0.90 (Paise ninety only) per kg. of the net content.	0.40	0.50
20.12	(c) Packed in Glass Bottles.	Re. 0.80 (Paise eighty only) per kg.of net content.	All C. Excise	

	When CENVAT facility has been availed :-			
20.13	(a) Packed in OTS Cans.	Rs. 9.00 (Rs. nine only) per kg. of the net weight of empty containers.	All Customs	
20.14	(b) Packed in Aseptic Bag kept in M.S.drums.	Rs. 0.40 (Paise forty only) per kg. of the net content.	All Customs	
	D. Prepartion of vegetables, fruits, nuts or other parts of plants not elsewhere specified.			
	When CENVAT facilty has not been availed :-			
20.15	(a) packed in OTS Cans.	Rs. 13.50 (Rs.thirteen and paise fifty only) per kg. of the net weight of empty containers.	9.00	4.50
20.16	(b) Packed in Aseptic bag kept in M.S. drums.	Re. 0.90 (Paise ninety only) per kg.of the net content.	0.40	0.50
20.17	(c) Packed in Glass Bottles.	Re. 0.80 (Paise eightly only) per kg. of net content.	All C. Excise	
	When CENVAT facility has been availed :-			
20-18	(a) Packed in OTS Cans.	Rs. 9.00(Rs.nine only) per kg. of the net weight of empty containers.	All Customs	
20-19	(b) Packed in Aseptic Bag Rept in M.S.drums.	Re. 0.40 (Paise forty only) per kg. of the net content.	All Customs	
	CHAPTER-21 **Miscellaneous Edible Preparations**			
	Chutneys and condiment, pastes all sorts, and Miscellaneous Edible preparation all sorts.			
	When CENVAT facility has not been availed :-			
21.01	(a) Packed in OTS Cans.	Rs. 13.50 (Rs. thirteen and paise fifty only) per kg. of the net weight of empty containers.	9.00	4.50
21.02	(b) Packed in Aseptic Bag kept in M.S.drums.	Re. 0.90 (Paise ninety only) per kg. of the net content.	0.40	0.50
21.03	(c) Packed in Glass Bottles	Re. 0.80 (Paise eighty only) per kg. of net content.	All C.Excise	
	When CENVAT facility has been availed :-			
21.04	(a) Packed in OTS Cans.	Rs. 9.00 (Rs. nine only) per kg. of the net weight of empty containers.	All Customs	
21.05	(b) Packed in Aseptic Bag kept in M.S.drums.	Re. 0.40 (Paise forty only) per kg. of the net content.	All Customs	
	CHAPTER -22 **Beverages, Spirits and Vinegars**			
22.01	Rectified Sprit (Ethyl Alcohol) having a minimum strength of 94.68% V/V at 15.6 degree centigrade.	Re. 1.80 (Rs. one and paise eight only) per litre.	All C.Excise	

RESEARCH ARTICLES

EVALUATION OF PICKLING CUCUMBER VARIETIES FOR BRINE - STOCK PRESERVATION

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ABSTRACT

Six varieties of pickling cucumber (Gherkin) viz., NUCH series 32, 33, 39, 40, 41 and Calypso-50 were evaluated for brine-stock preservation. A slight variation in the physico-chemical composition and not much differences in lactic acid production during fermentation of different varieties of cucumber were noticed. Fermentation in brine with 7.5% sodium chloride at equilibrated level for 4 to 5 days resulted in the formation of 0.6% lactic acid in all the varieties. Storing the pickling cucumber at 14 % equilibrated salt level resulted in microbiologically stable and good quality salt-stock product. Cultivar NCUH-32 produced best quality salt-stock with maximum overall sensory scores for colour, texture, flavour and taste.

INTRODUCTION

Brining is one of the oldest methods of preservation and many vegetables can be preserved by this technique. Commercial bulk storage of vegetables by bring with or without fermentation has long been in practice in several countries as a low energy means of storage (Prescott and Dunn, 1959; Fleming and McFeeters, 1981; Sethi, 1990). Pickling cucumbers are generally utilized in the manufacture of fresh, uncured salt- stock by fermentation or preservation using higher salt concentrations (Bell et al, 1972; Fleming , 1984). The production of pickling cucumber has been a sizable economic enterprise in many European and Western countries where the brine-stock is used in the preparation of staple products like sweets, sours, mixed pickles, processed dills, hamburger slices, relishes etc., (Etchells et al, 1974). In India, production and export of pickling cucumber is of recent origin (Anonymous, 1994). Due to rapid increase in consumption of cucumbers throughout the world, greater interest is seen in growing and exports of these cucumbers. Most of the pickling cucumbers are exported in the form of brine-stock only. Recently, freshly packed pasteurised cucumber has also been introduced in the local market. A process for preparation of brine-stock pickling cucumber has been reported (Suresh et al, 1997). The characteristics of pickling cucumber has great effect on the nature of fermentation and quality of pickles (Lee et al, 1982). Therefore, Six exotic cultivars of pickling cucumbers obtained from the germplasm collection of the Institute were evaluated for brining quality and the results are presented in this paper.

MATERIALS AND METHODS

Pickling cucumbers : Six exotic

varieties of pickling cucumbers viz., NCUH series 32,33,39,40,41 and Calypso-50 grown in net house at the experimental farm of the Institute were harvested after two days of fruit setting and were washed thoroughly under tap water. They were grouped into 3 grades viz., small, medium and big based on individual fruit weight. Fifteen cucumbers from each grade were used for recording length, diameter, weight, shape and colour. Chemical parameters like total soluble solids (°Brix), acidity, pH and dry matter were analysed by standard methods (Ranganna 1986).

Brining and fermentation : Five hundred gram lots of small size (2 to 2.5 cm. Dia) pickling cucumbers of each variety with individual weight of 6-8 g. were brined in 1:1 (w/v) ratio in 1 litre Erlenmeyer flask. The brine contained 7.5 % sodium chloride and 0.05 % each of calcium chloride and acetic acid at equilibrated levels. Brined gherkins were allowed to undergo fermentation at room temperature (25±4°C) by natural flora. After 5 days, the partially fermented gherkins were separated by draining and repacked in 1 litre capacity plastic jars using decanted brine. The salt level was equilibrated to 10% concentration by the addition of dry salt. Subsequently, at weekly intervals, the salt level was increased by 2% till the final concentration of 14% was attained at the end of 3 weeks of fermentation period. The jars were closed air tight and stored at ambient temperature (25±7°C) for 6 months.

Acidity and pH : The development of acidity and changes in pH of brine solution were measured at 0, 2, 3, 4, 5, 7, 14 and 21 days of fermentation period. Observations on brine turbidity and attainment of translucency of the internal part after slicing lengthwise were also recorded.

Texture : The texture of fresh as well as salt-stock cucumbers were measured using "Instron 4201" with 3mm. dia probe and a piercing force of 25 Kg using 500kg load at a speed of 100mm/min. Six replicates were made and the average values were expressed as kg.

Sensory evaluation : The sensory evaluation of salt-stock pickling cucumbers stored for six months were done as described by Amerine et al, (1965). Brine stock cucumbers were desalted to approximately 2% salt level by repeated washing with running water. A panel of six judges evaluated the quality with respect to colour, flavour, texture and taste using a rating scale of 1 to 10 for individual character. Statistical analyses were done by the standard method (Snedecor and Cochran, 1967). The sample with maximum average score was considered the best.

RESULTS AND DISCUSSION

The data on various physico-chemical parameters studied in different pickling cucumber cultivars are presented in Table -1. Visual quality evaluation indicated that cultivars NCUH-32, NCUH-33 and NCUH-39 were characterised by straight cylindrical shape which is generally preferred for pickling purposes. Other three cultivars had a slightly curved shape wth oval tip. All the six cultivars had a desirable light to uniform dark green skin colour. The range of values for different parameters in six pickling cucumber cultivars graded into small, medium and big size were as follows: TSS 3.0 to 5.0°Brix; acidity 0.18 to 0.50%; pH 5.4 to 6.4 and moisture 92.8 to 96.8%. . It is reported that although smaller cucumbers command a premium price, medium and larger sizes up to 5 cm dia are also preferred for making hamburger dill slices, dill spears and pickle relishes (Ethells et al, 1974). Present study revealed that in general small cucumbers had more TSS, acidity, pH and less moisture content than the big sized ones in all the six cultivars. These results agree with the observations recorded earlier (Etchells et al, 1974; Suresh et al, 1997). Although sugar content was not determined, the total soluble solids, which includes sugars also did not vary much among different cultivars. Carbohydrates in cucumber play an important role in the fermentation as well as the stability of brine-stock cucumbers and complete utilization of fermentable sugars is essential to prevent undesirable secondary fermentation (Fleming et al, 1983). Similarly, the buffering capacity of cucumber is also important as it influences the extent of sugar

utilization during primary fermentation. It is reported that smaller sized cucumbers possess more buffering capacity than larger sized and hence smaller ones are preferred for fermentation (Etchells and Moore, 1971). No appreciable variation in moisture content among different cultivars was noticed. However, big size cucumbers had comparatively high moisture content which makes them more susceptible to rapid weight loss and shrivelling. Hence, it is advisable to reduce the holding time prior to brining and fermentation of these cucumbers. In addition, it is reported that large size cucumbers become more susceptible to bloater damage during brining preservation due to structural changes taking place in cucumbers during growth (Fleming et al, 1973).

In commercial brining process, salt concentration is most important for determining the nature of fermentation and shelf life of gherkins. During the early part of salt stock process, the brine strength has to be carefully controlled to permit a desirable level of acid production. Our recent study indicated that an initial salt concentration of 5.0 to 7.5% at equilibrated level was optimum for fermentation (Suresh et al, 1997). Since a minimum of 0.6% acidity is required prior to raising the brine strength in the salt-stock process (Etchells and Hentz, 1972), pickling cucumbers were fermented till the development of desired level of acidity. From Table 2, it is evident that an initial fermentation period of 4-5 days was sufficient to get 0.6% acidity in all the six pickling cucumber cultivars. The pH drop was from 4.80 to 3.50. Salt concentration of 10% or higher in solution with a pH of 4.6 or below is known to inhibit all pathogenic micoorganisms (Etchells et al, 1974). Hence, in order to make the product microbiologically stable, the brine strength was raised to a final concentration of 14%. In the present study, salt stock prepared from all the six cultivars were found to be in good condition during six months of storage at room temperature (25±7^0 C). No surface growth of spoilage organisms was noticed in these samples.

The changes in texture of pickling cucumbers and appearance of translucency of internal content during storage is given in Table 3. Early curing of salt-stock as indicated by the changes in the flesh from opaque to translucent appearance is essential.

Among the pickling cucumbers tested, varieties NCUH-32, NCUH-40, NCUH-41 and Calypso-50 attained full translucency after one month of brining. In the other two varieties, it was delayed by additional 2-4 weeks. Softening is a major concern in cucumber fermentation and hence retention of texture is a primary quality attributed to salt-stock cucumbers. From Table 3, it is observed that although Calypso-50 had the maximum initial texture, retention during storage was poor. At the end of 6 months of storage period, the texture values of cured salt-stock from all the varieties were almost similar. Sensory evaluation indicated that NCUH-39 and NCUH-32 had the maximum overall score. However, in fermented cucumber variety NCUH-32, Completion of translucency was observed at comparatively short period. Hence this variety was considered to be the best one for fermentation.

The present study revealed that good quality brine stock pickling cucumber can be obtained by the fermentation in 7.5 % equilibrated concentration of sodium chloride solution for 4 to 5 days initially and raising the salt level to 14%. Thus the seasonal excess production can be better utilised by preserving them as salt-stock for later use. A slight variation in the physico-chemical composition was noticed among six cultivars of pickling cucumbers. Cultivar NCUH-32 produced good quality salt stock with maximum sensory attributes for colour, texture, flavour and taste.

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Table :1 Physico-chemical composition of different grades of six pickling cucumber varieties

Variety	Grade	Length (cm)	Diameter (cm)	Weight (gram)	T.S.S* (°Brix)	Acidity* (Lactic acid)	pH*	Moisture* (%)	Dry-matter* (%)
NCUH 32	S	5.12±0.75	2.37±0.25	7.50±2.38	4.0	0.25	6.1	93.9	6.1
	M	7.50±0.00	3.00±0.71	25.00±1.41	3.0	0.31	6.2	95.3	4.7
	B	9.00±1.41	3.00±0.14	38.00±2.83	3.0	0.23	6.1	96.0	4.0
NCUH 33	S	5.62±0.85	2.07±0.30	7.25±1.71	5.0	0.23	6.4	95.5	6.5
	M	6.50±1.18	2.62±0.25	13.75±4.35	3.0	0.18	6.2	95.2	4.8
	B	8.16±0.37	3.16±0.17	30.33±4.58	3.0	0.18	5.9	95.1	4.9
NCUH 39	S	5.50±0.16	2.53±0.03	8.33±1.71	4.0	0.30	6.2	94.0	6.0
	M	6.65±0.49	2.75±0.35	14.50±4.95	5.0	0.31	6.0	94.9	6.1
	B	8.00±0.00	2.00±0.14	26.00±1.41	4.0	0.21	5.5	96.8	3.2
NUCH 40	S	5.36±0.42	2.00±0.38	6.67±1.63	4.5	0.36	6.2	93.7	6.3
	M	6.62±0.25	2.70±0.24	13.75±4.99	3.5	0.50	5.8	95.0	5.0
	B	8.00±1.41	3.50±0.28	25.00±1.41	3.0	0.22	5.4	96.7	3.3
NUCH 41	S	5.87±0.75	2.10±0.48	7.25±2.06	4.0	0.18	6.2	93.8	6.2
	M	7.00±0.50	3.00±0.00	15.67±3.04	3.5	0.25	5.7	95.6	4.4
	B	8.75±0.35	3.50±0.00	29.00±2.83	3.9	0.23	5.7	95.1	4.9
CALYPSO 50	S	5.43±0.77	2.16±0.17	7.66±1.90	5.0	0.31	6.4	92.8	7.2
	M	6.67±0.84	2.66±0.17	15.00±2.92	4.0	0.29	6.0	94.9	5.1
	B	8.50±0.71	3.25±0.35	32.00±9.90	4.0	0.22	5.7	95.1	4.9

± S.D.values *average of duplicate values

S Small (5-10g) : M : Medium (10-25g) : B. Big (25-50g)

Table-2 Change in brine acidity * and pH during fermentation of six varieties of Pickling cucumbers for salt-stock.

Fermn. Period (days)	Pickling cucumber varieties											
	NCUCH 32		NUCH 33		NUCH 39		NUCH 40		NUCH 41		CALYPSO-50	
	Aci-dity(%)	pH	Aci-dity(%)	pH	Aci-dity(%)	pH	Aci-dity(5)	pH	Aci-(dity%)	pH	Aci-(dity%)	pH
0	0.05	4.84	0.06	4.80	0.05	4.78	0.05	4.80	0.05	4.82	0.05	4.81
2	0.25	4.73	0.27	4.67	0.21	4.92	0.21	4.78	0.23	4.75	0.28	4.84
3	0.49	3.76	0.54	3.71	0.50	3.74	0.45	3.75	0.49	3.68	0.53	3.82
4	0.59	3.60	0.65	3.62	0.63	3.52	0.63	3.59	0.66	3.54	0.57	3.66
5	0.65	3.57	0.68	3.51	0.71	3.48	0.70	3.42	0.73	3.38	0.65	3.57
7	0.65	3.51	0.67	3.40	0.70	3.43	0.68	3.40	0.72	3.40	0.66	3.54
14	0.66	3.44	0.67	3.38	0.72	3.40	0.68	3.28	0.72	3.30	0.67	3.42
21	0.68	3.30	0.68	3.40	0.74	3.38	0.70	3.25	0.73	3.26	0.70	3.40
S.D.Values	±0.23	±0.59	±0.23	±0.57	±0.26	±0.64	±0.25	±0.64	±0.26	±0.64	±0.23	±0.60

*Acidity expressed in terms of lactic acid.

Table 3 : Quality attributes of fermented pickling cucumbers for salt-stock preservcation.

Variety	Completion of translucency (months)	Texture (Kg)		Organoleptic quality scores after 6 months storage				
		Initial	After 6 Months	Colour	Flavour	Texture	Taste	Overall Quality
NUCH 32	One	1.66±0.22	1.33±0.08	7.62±0.41	7.00±0.28	7.50±0.28	6.87±0.77	7.25±0.61
NUCH 33	Two	1.65±0.14	1.42±0.08	7.00±0.71	7.00±0.28	7.13±0.21	6.75±0.67	6.97±0.46
NUCH 39	Two	1.70±0.09	1.34±0.04	7.62±0.13	6.75±0.39	7.63±0.42	7.00±0.85	7.25±0.69
NUCH 40	One	1.61±0.21	1.38±0.10	7.62±0.42	6.75±1.25	6.37±0.42	6.62±1.56	7.09±0.95
NUCH 41	One	1.66±0.16	1.42±0.07	7.25±0.25	6.62±0.42	7.13±0.35	6.87±0.21	6.97±0.46
Calypso 50	One	1.74±0.18	1.29±0.04	7.75±0.11	6.87±0.63	6.75±0.54	6.50±0.71	6.97±0.62

± S.D.values

DEVELOPMENT OF A WRAP - PACK METHOD FOR VEGETABLE PRESERVATION

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ABSTRACT

Bittergound and Drumstick were wrapped with aluminium foil and over-wrapped with manifold paper. The wrapped units were separately steam sterilised in a still autoclave. After opening the autoclave they were vacuum packed in irradiation sterilised laminated pouches. Prior inoculation of the vegetables with *Cl. Sp.* spores and their absence after pouching have been shown by carrying out MPN test. Organoleptic evaluation was carried out. Simulated studies on sterility were carried out to confirm that the paper allows steam to sterilise the nutrient media and prevented aerial contamination of the media during transfer from autoclave to sterile pouch and later acted as a barrier during storage assisting in extension of shelf life.The use of manifold paper as a microbial barrier has been proposed showing the possibility of a novel wrap-pack method for vegetable preservation.

INTRODUCTION

Patwardhan (1999) has shown the use of manifold paper in warding off the environmental microbial contamination. He has utilised the manifold paper in development of appropriate aseptic packaging of vegetables. On further thinking it was felt that a method could be developed for pouch packaging by just wrapping the vegetables in the paper before steam processing. Accordingly experiments were carried out as follows:

MATERIALS AND METHODS

- Bittergourd and Drumstick vegetables procured from the local market.
- Superwrap aluminium foil from "Indian Aluminium Company".
- A1 American autoclave 21 litre capacity with metal to metal joint with lid.
- 10^3 conc. *Clostridium sporogenes* spore alginate beads prepared as per Patwardhan and Badgujar (1999).
- Pouches of 20cm x 20cm size prepared from 12 micron polyester.
- 12 micron aluminium foil and 100 gauge LDPE laminate procured from M/S Sharp Industries, Mumbai. (10 such pouches were packed in large polythene bag sealed on all sides and were gamma irradiated with 2.5 mega-rad at BARC for container sterilization. Only such sterile pouches were used for pouching of wrap packed units.)
- Twine thread.
- Sterility media, namely, M017A for aerobes, M018 B for anaerobes and M033 Sabouraud's for fungus.
- Calcium carbonate.
- Glacial acetic acid.
- Test tubes.
- Surgical cotton
- 10cm X 7cm X 3cm aluminium casseroles of 200ml capacity.
- Triangle packing gas flusher.
- Two feet long metal tongs.

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- 37°C and 55°C incubators.

MPN method was followed as per the standard procedure of American Public Health Association [APHA][3].

Brief Description of MPN :

A) Preparation of inoculum *Cl. Sp* [MTCC code 1349] was maintained by subculturing in Reinforced Clostridal Medium [RCM] grown at 30°C in an anaerobic jar for 3 to 5 days and held in refrigerator. The cells were raised in the same medium [RC broth] under similar conditions, centrifuged/ washed thrice in saline and suspended in saline. The dilutions were prepared in saline for assessment of viable count. To determine the spore load the suspension was heat-shocked [80°C for 5 minutes] and colony forming units (CFU) were expressed after appropriate dilutions using roll tubes containing RCM agar [FDA,1996; Splittstoesser, 1992].

B) Microbial analysis of pouched vegetables was carried out using 2 packs for each incubation. After incubation at 37°C for 45 days, further incubation was followed for 45 days at 55°C.

C) Serial dilutions were prepared in sterile saline after incubation and used for aerobic plate count with pour plating using plate count agar [Hi - media, Mumbai]. After incubation at 30°C for 5 days, CFU were counted. Serial dilutions were similarly used for scoring the MPN of *Clostrium sp.* surviving the process in inoculated pouches using enrichment technique with RCM broth [Hi- media, Mumbai] incubated at 30°C for 5 days.

Transfer into pouch : After steam sterilization the autoclave is opened at about 2/3 pounds pressure to minimize steam condensation. The wrapped units are then picked by long tongs and transferred under the sterile laminar air flow into the sterile pouch. [Figure1].

Experiment 1 : Vegetables, namely, Bittergound and Drumstick were thoroughly washed. Cut pieces of average length 3.1 cm bittergourd and 7.6 cm drumstick were used. Alginate spore beads from *Cl.sp.* [MTCC Code 1349], prepared as per (Patwardhan and Badgujar 1999) out of 10^3 per ml conc, were used. 10 beads were inserted into 4 pieces of each vegetable. 20 lots of 100 grams of each vegetable were weighed. Each lot was individually wrapped with foil first. Then each unit was over wrapped with manifold paper. The units were tied with twine.

These 20 wrapped units were commercially sterlized by placing them in a stainless steel vessel in the autoclave at 10 pounds [7030.7kg/m^2] steam pressure for 10 minutes. 10 sterilized units of each vegetable were transferred to sterile pouches as shown in Figure 1 and vacuum packed in 10 pouches 20 x 20 cm. Vacuum was almost 30 inches. The pouched vegetables were incubated at 37°C and 55°C for 45 days each. After incubation MPN test for *Cl. Sp.* was carried out for the 4 pouches containing spore beads as detailed by Patwardhan (1998). The MPN estimation of the spore beads was carried out to confirm the reliability of the method and test conditions.

Experiment 2 : The three sterility testing media, namely, M017, M018 AND M033 were prepared as per the directions of HI MEDIA Lab, Mumbai. 2 percent agar was added. 3 Aluminium casseroles containing 50ml of each media were foil and paper wrapped and then these casseroles were sterlized at 15 pounds [1.1 Kg/sq mm] pressure for 15 min.

The casseroles were transferred (Figure1) into sterile pouches and vacuum pouched at 30 inches vacuum. The pouches were then incubated at 37°C for 45 days followed by 45 days at 55°C.

One casserole of each media was wrapped with foil and manifold paper and all the three were incubated at 37°C and 55°C.

Experiment 3 : Bittergourd and Drumstick were pouch-packed by the novel method. Ten pouches of each vegetable were prepared. 5 were tasted after 15 days storage and 5 after 7 months storage at ambient conditions by 5 staff members.

RESULTS AND DISCUSSION

The MPN test in Experiment 1 showed absence of *Cl. Sp.* in the samples inoculated with its spores. The results also compare well with the inoculated pack studies of drumstick carried out by Saikia and Ranganna (1992). They inoculated the drumstick in A1 Tall cans with 10^3 and 10^4 /ml concentration spores and processed the seamed cans at 10 lbs. steam pressure for 12.8 minutes. Explaining the results, they said that subcultruring of the cans showed no growth under aerobic or anaerobic conditions.

In the casseroles in Experiment 2, no growth of any type was perceptible after 45 days incubation at 37°C followed by incubation at 55°C for 45 days. The experiment showed that the paper allows steam to sterilize the nutrient media and prevents aerial contamination of the media during transfer from autoclave to sterile pouch and later acts as a barrier during storage, assisting in extension of shelf life. The chance landed microbes on the barrier - paper, if any, could not grow in the pouch having anaerobic conditions and could not contaminate the enclosed nutrient media, supporting the utility of paper-membrane-barrier in the wrappack packaging of sterile vegetables. However the three unsterilized media in casseroles showed growth and developed foul odour indicating the normalness of test conditions.

The 5 staff members unanimously opined that the products of Experiment 3 were in excellent condition and have a characteristic colour, flavour and taste after 15 days and 7 months. As a matter of fact, since possibly steam can penetrate through the openings in the folds of the foil, it is most likely that the temperature necessary to inactivate the microbes is achieved faster and evenly.

Like the cotton plug the manifold paper prevents the contamination in sterilization of media and later prevention of contamination in all microbiological work. Since the steam sterilized wrapped units are slightly hot, the vapours coming out of the units might be helpful to ward off any aerial contamination. Besides the sterile air flow from the laminar flow equipment is an additional guard covering transfer operation. The growth of any chance landed microbe is inhibited because of low air/ oxygen. Though the paper wrapped spiced bittergourd is traditionally relished by the Gujarati Community, paper in direct contact with food may not be liked by consumers in general. In view of this the vegetables were first wrapped with foil and then with paper.

CONCLUSION

The results show that the wrapping in foil followed by paper while allowing steam sterilization prevents contaminat-ion of the vegetable during transfer into sterile pouch. Commercial exploitation based on the results may be possible if wrapping and over-wrapping of the vegetables is mechanised. A novel method for preservation of particulate food seems possible.

The advantages are :

1. Low investment compared to other sterilization preservation methods.
2. Use of indigenous materials.
3. May generate employment.
4. Easy opening of product.

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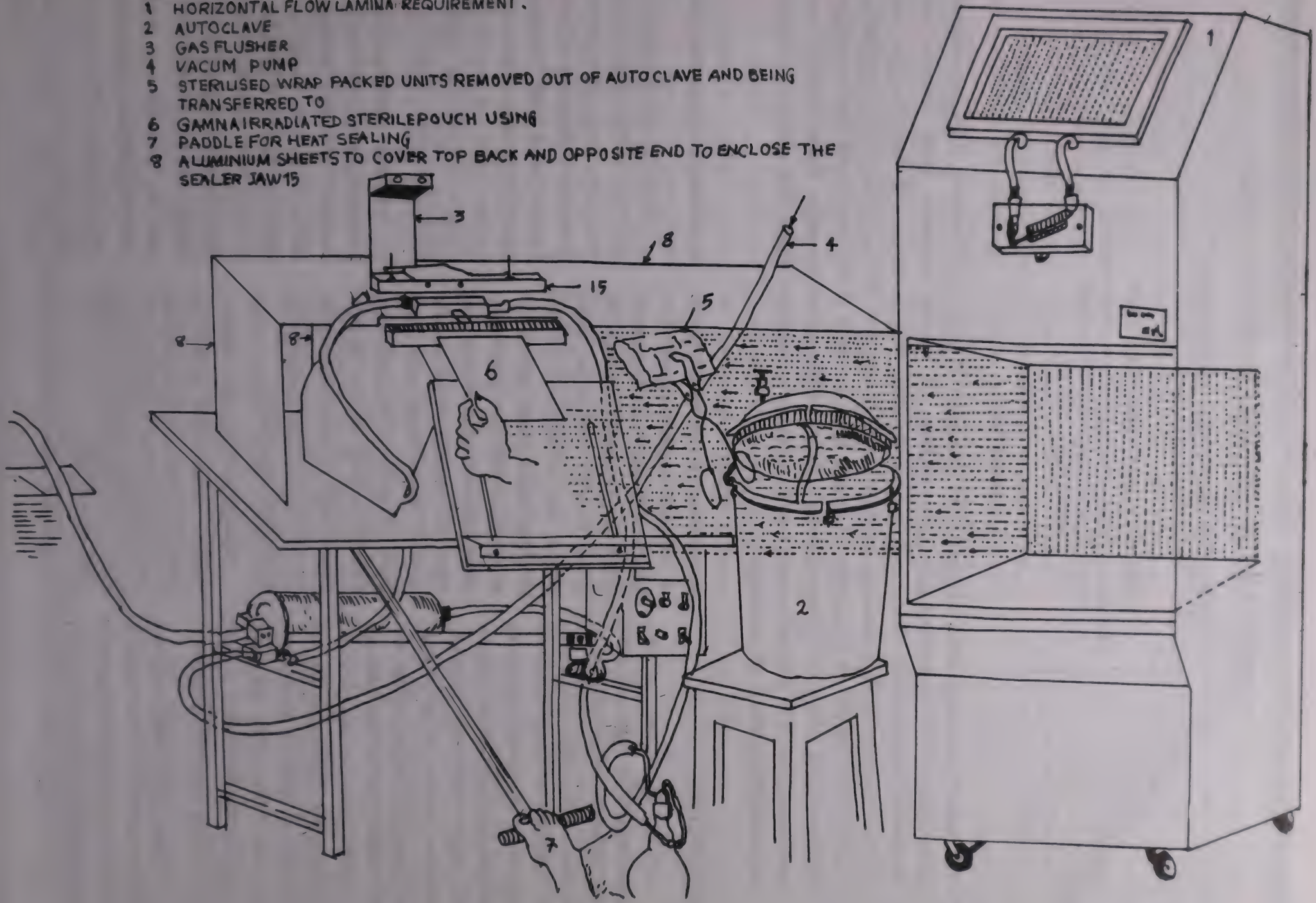
LEGEND

1 HORIZONTAL FLOW LAMINA REQUIREMENT.
2 AUTOCLAVE
3 GAS FLUSHER
4 VACUM PUMP
5 STERILISED WRAP PACKED UNITS REMOVED OUT OF AUTOCLAVE AND BEING TRANSFERRED TO
6 GAMNA IRRADIATED STERILEPOUCH USING
7 PADDLE FOR HEAT SEALING
8 ALUMINIUM SHEETS TO COVER TOP BACK AND OPPOSITE END TO ENCLOSE THE SEALER JAW 15



PREPARATION OF MIXED FRUIT JUICE SPICED RTS BEVERAGES

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ABSTRACT

RTS spiced beverages were prepared from blended fruit juices of lime-*aonla*, mango-pineapple, grape-mango and grape-pineapple with addition of various aqueous spice extracts and commercial spice drops. The spiced lime-*aonla* (95:5) RTS beverage with salt [common salt (0.5%)+ black salt (0.5%)], aqueous spice extracts of curry leaf (0.5%), cumin (0.25%), cardamom (0.25%), black pepper (0.1%), juices of ginger (2%) and mint (0.4%) was found best among all the beverages. Likewise, mango-pineapple (85:15) with cardamom spice drops (0.006%) was best among the RTS beverages prepared from commercial spice drops. The addition of spices improved the quality of beverages.

INTRODUCTION

Owing to high acidity, astringency, blunt taste and such other factors in some of the fruits like lime, *aonla*, black grape etc., the utilization of these fruits for preparation of various processed products becomes limited, despite their high nutritional qualities. Therefore, blending of two or more fruit juices and their beverages with the addition of spice extracts/drops as health drinks are thought to be a convenient alternative for its utilization in order to have some value added fruit drinks which are of high quality in respect of both sensory and nutritional aspects.

Of late, spiced beverages are gaining importance in the market in the form of fruit drinks/squashes/ appetizers/health drinks etc. It is reported that the organoleptic quality of RTS beverages prepared from juice such as plum and watermelon could be increased by addition of spice extracts of ginger, black pepper, mint, cardamom and cumin etc. (Joshi et al., 1993., and Gowda and Jalali, 1995). The blending of juices and their spiced beverages may also improve taste, aroma, nutrition etc. Finally, one could think of a new product development through blending in the form of natural health drinks. So far no work has been carried out on mixed fruit juice spiced beverages.

Keeping these in view, a research study was carried out during 1998-1999 in the Post Harvest Technology Unit of the Division of Fruits and Horticultural Technology, IARI, New Delhi.

MATERIALS AND METHODS

The fruits of *Dashehari* variety of mango, *Desi* variety of *aonla*, *Kagzi* lime and *Kew* variety of pineapple were purchased from the Azadpur Mandi, Delhi. Pusa Navrang variety of grapes (coloured) was collected from the orchard of the Division of Fruits and Horticultural Technology during 1998 and 1999.

Extraction of juice/pulp and their processing was done as per the standard methods. Juice/pulp of mango, pineapple, *aonla*, lime and grape was blended in different ratios (5-95%). The blended juices/pulp (lime-*aonla*, mango-pineapple, grape-mango and grape-pineapple) were used for preparation of ready-to-serve (RTS) beverages having 15 per cent juice/pulp, 10°Brix and 0.2 per cent acidity except in lime-*aonla*

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RTS beverage which had 6 per cent juice, 10°Brix and 0.3 per cent acidity. Out of fifty two combinations only four best recipes, one from each group viz. LA-95 (lime 95% + *aonla* 5%), MP-85 (mango 85% + pineapple 15%), GM-95 (grape 95% + mango 5%) and GP-85 (grape 85%+pineapple 15%) were selected based on sensory evaluation by using hedonic scale. To these selected beverages, in one lot aqueous spice extract of curry leaf (0.5%), cumin (0.25%), cardamon (0.25%), black pepper (0.1%) and juices of ginger (0.5-2.0%) and mint (0.4%) along with 1-2 per cent salt (common and black salt) were mixed. In another lot commercial spice drops of ginger, cumin, cardamom and *garam masala* were added in different proportions (0.002-0.006%) to RTS beverages. Commercial spice drops are concentrated aqueous extracts, 5 ml of which is equivalent to 100g of cardamom, 300 g of cumin, 300g of *garam masala* and 400g of ginger.

TSS, acidity, pH, total cartenoids, NEB, sugars, ascorbic acid and tannins were estimated using the methods described by Ranganna (1997). Total anthocyanins were estimated by the method of Fuleki and Francis (1968). For microbial qualities total plate counts for moulds, yeasts and bacteria were made by the standard procedures (Seeley and Van Demark, 1970).

RESULTS AND DISCUSSION

The quality of RTS beverages with added aqueous spice extracts and commercial spice drops was improved over non-spiced beverages. Among the aqueous spice extract added beverages, LAS-10 (lime 95%+ *aonla* 5%+ginger2%+salt 1%+other spices) was the best beverage (Table 1). Among the beverages with added commercial spice drops, MPCa-3 (mango 85%+pineapple 15%+cardamom 0.006%) was found to be overall best (Table 1) having a score of 7.83 followed by GMGn - 3 (grape 95%+mango 5% + ginger 0.006%), LAGm - 1 (lime 95% + *aonla* 5% + *garam masala* 0.002%) and GPGn-3 (grape 85%+pineapple 15%+ginger 0.006%). The addition of commercial spice drops (ginger, cumin and cardamom) individually in the concentration ranging between 0.002 to 0.006 per cent was found better in comparison to addition of these spice drops together in the same concentration as the latter reduced the organoleptic quality of the RTS beverages.

Among the beverages prepared with aqueous spice extract, MPS-4 (mango 85% + pineapple 15% + ginger 1% + salt 1% + other spices) was better (Table 2) in ascorbic acid (1.84mg / 100 ml), TSS (11.2°Birix), °Brix:acid ratio (58.95) and total carotenoids (1.08 mg/100 ml) content. Likewise, among the beverages prepared from commercial spice drops (Table 2), MPCa-3 (mango 85% +pineapple 15% + cardamom 0.006%) has the highest ascorbic acid, TSS, sugars and total carotenoids as compared to other beverages. Higher ascorbic acid, TSS, sugars and total carotenoids in MPCa-3 might be due to blending of both mango pulp and pineapple juice. The addition of spices to the RTS beverages had slightly increased the ascorbic acid, sugars, tannins and NEB of these drinks. The increase in ascorbic acid, sugars etc. was also reported by Joshi *et al.* (1993) in spiced plum RTS beverages and Chauhan *et al.* (1997) in sugarcane RTS beverages.

No bacterial growth was observed in the spiced mixed fruit juice RTS beverages. However, there was negligible growth of mould and yeast in the drinks. This might be due to the inhibitory effect of spices towards microorganisms (Ejechi *et al.*, 1998).

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Table 1. Overall sensory scores of different spiced beverages

Treatments	LA	MP	GP	GM
(i) Aquous spice extract				
S-1 (ginger 0.5%+salt 1%+other spices)	7.13	7.57	7.18	6.96
S-2 (ginger 0.5%+salt 1.5%+other spices)	7.65	7.51	6.60	6.67
S-3 (ginger 0.5%+salt 2%+other spices)	7.57	7.40	6.17	6.38
S-4 (ginger 1%+salt 1%+other spices)	7.81	7.76	7.08	6.94
S-5 (ginger 1%+salt 1.5%+ other spices)	7.45	7.11	6.59	6.38
S-6 (ginger 1%+salt 2%+other spices)	7.09	6.80	5.89	6.36
S-7 (ginger 1.5%+salt 1%+other spices)	7.44	7.45	7.04	6.92
S-8 (ginger 1.5%+salt 1.5%+other spices)	7.56	7.20	6.37	6.55
S-9 (ginger 1.5%+salt 1.5%+other spices)	6.85	7.02	5.46	6.32
S-10 (ginger 2%+salt 1%+other spices)	8.20	7.57	6.40	6.86
S-11 (ginger 2%+salt 1.5%+other spices)	7.40	7.17	5.58	6.38
S-12 (ginger 2%+salt 2% + other spices)	7.00	6.00	6.10	6.06
CD (P=0.05)	0.06	0.19	0.18	0.25
(ii) Commercial spice drops				
Gn-1 (ginger 0.002%)	7.16	7.66	7.09	7.24
Gn-2 (ginger 0.004%)	7.20	7.53	7.18	7.45
Gn-3 (ginger 0.006%)	7.41	7.62	7.43	7.49
Ca-1 (cardamom 0.002%)	7.09	7.78	7.02	7.08
Ca-2 (cardamom 0.004%)	7.25	7.76	7.37	7.10
Ca-3 (cardamom 0.006%)	7.14	7.83	6.94	6.99
Gm-1 (*garam masala* 0.002%)	7.47	7.42	7.35	7.16
Gm-2 (*garam masala* 0.004%)	7.23	7.63	7.26	7.03
Gm-3 (*garam masala* 0.006%)	7.08	7.57	7.08	7.06
Cu-1 (cumin 0.002%)	6.90	7.64	7.27	7.33
Cu-2 (cumin 0.004%)	7.20	7.58	7.19	7.35
Cu-3 (cumin 0.006%)	7.11	7.49	7.02	7.25
CSD-1 (Gn-1+Ca-1+Cu-1)	7.34	7.65	6.81	6.28
CSD-2 (Gn-1+Ca-2+Cu-1)	6.95	7.70	6.87	6.03
CSD-3 (Gn-2+Ca-1+ Cu-1)	6.83	7.54	6.86	6.08
CSD-4 (Gn-2+Ca-2+Cu-1)	7.11	7.61	6.79	5.94
CSD-5 (Gn-3+Ca-1+Cu-1)	7.07	7.53	6.49	5.92
CSD-6 (Gn-3+Ca-2+Cu-1)	7.12	7.40	6.82	5.89
CD (P=0.05)	0.04	0.09	0.12	0.24

Other spices=0.5% curry leaf+ 0.25% cumin+0.25% cardamom+0.1% black pepper +0.4% mint, Salt 1%=common salt 0.5%+black salt 0.5%, Salt 1.5%=common salt 1%+black salt 0.5%, Salt 2%=common salt 2%, LA=Lime-aonla, MP=Mango-pineapple, GP=Grape-pineapple, GM=Grape-mango

Table 2 : Nutritional and microbial qualities of mixed fruit juice spiced RTS beverages.

Parameters	GPS-1	GMS-1	MPS-4	LAS-10	CD (P=0.05)
(i) Aqueous spice extract					
TSS (°Brix)	10.1	10.9	11.2	11.1	NS
Titratable acidity (%)	0.19	0.19	0.19	0.32	0.01
pH	3.52	3.41	3.55	2.98	0.08
°Brix/acid ratio	52.63	57.37	58.95	34.69	3.65
Sugars(%) : Reducing	4.58	4.57	3.59	3.26	0.12
Total	9.53	9.68	9.53	8.84	0.05
Ascorbic acid (mg/100 ml)	0.29	0.31	1.84	1.37	0.04
Tannins (% tannic acid)	0.20	0.18	0.16	0.11	0.03
Total anthocyanins (mg/100ml)	4.24	6.01	-	-	-
Total carotenoids (mg/100 ml)	-	0.02	1.08	-	-
NEB (OD at 440 nm)	0.22	0.25	0.19	0.05	0.01
Microbial load (cfu/ml)					
Mould	3.0×10^3	2.5×10^3	3.0×10^3	2.0×10^3	
Yeast	1.0×10^3	1.5×10^3	1.5×10^3	1.5×10^3	
Bacteria	Nil	Nil	Nil	Nil	

(ii) Commercial spice drops

	GPGn-3	GMGn-3	MPCa-3	LAGm-1	
TSS (°Brix)	10.1	10.0	10.2	10.1	NS
Titratable acidity (%)	0.19	0.20	0.23	0.32	0.04
pH	3.63	3.54	3.39	2.78	0.02
°Brix/acid ratio	33.26	50.00	44.35	31.63	2.85
Sugars (%)					
Reducing	3.71	3.70	4.22	3.70	0.04
Total	8.33	8.33	9.58	8.69	0.13
Ascorbic acid (mg/100ml)	0.29	0.03	1.82	1.35	0.08
Tannins (% tannic acid)	0.17	0.17	0.17	0.14	0.03
Total anthocyanins (mg/100 ml)	4.29	6.11	1.23	-	-
Total carotenoids (mg/100 ml)	-	0.02	1.23	-	-
NEB (OD at 440 nm)	0.20	0.22	0.12	0.07	0.01
Microbial load (cfu/ml)					
Mould	2.5×10^3	2.0×10^3	3.0×10^3	2.0×10^3	
Yeast	1.5×10^3	1.5×10^3	1.5×10^3	1.5×10^3	
Bacteria	Nil	Nil	Nil	Nil	

RELATIONSHIP BETWEEN MOISTURE SORPTION AND TEXTURE CHARACTERISTICS OF SUGAR CONFECTIONERY

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ABSTRACT

Moisture sorption characteristics of three types of sugar confectionery-hard boiled, toffee and chocolates were investigated. In general, acceptable crispness was lost above a water activity of 0.44, while below 0.11 water activity, the products became hard. The moisture sorption isotherms to the products were typical BET type IV of high sugar food products. Texture evaluation of specimen, hard boiled by compression and toffee by shear force was carried out. Complete liquefaction of the products was noticed above 0.86 water activity.

INTRODUCTION

The moisture content-relative humidity relationships of any food material is of prime importance in food formulation, handling and storage, processing and packaging (Labuza 1968). Moisture sorption isotherms provide the necessary information to predict shelf-life based on moisture protection required (Labuza et. al. 1981; Diosady et al. 1996). The moisture sorption curve (Isotherm) depicts the equilibrium moisture content in the product under various relative humidity or water activity conditions at a particular temperature.

In sugar confectionery, prevention of stickiness and softening depends on the knowledge of the moisture adsorption characteristics of the constituent sugars in amorphous state in relation to the ambient water activity (aw) or relative humidity (RH) and the transformation from amorphous to crystalline state and liquefaction (Heiss 1959).

There are many publications that deal with the determination of moisture adsorpition-desorption characteristics of sucrose and glucose (Smith et al. 1981; Makower and Dye 1956; White and Cakebread 1966); however there are no reports on the sugar confectionery items even in the Handbook of Food Isotherms (Iglesias and Chirife 1982). Hence, the present study was undertaken to obtain data on the moisture sorption characteristics of three types of sugar confectionery. The measurements, were made by following the changes in weight of the products placed in chambers maintained at various water activities varying from 0.11 to 0.92 at 27±1°C. Visual and in some cases, sensory and instrumental evaluations were also carried out to determine the physical changes in the products.

MATERIALS AND METHODS

All the confectionery samples were obtained from a reputed company immediately after production. The samples were classified into the following categories:

i) ***Hard boiled sweets :*** Hard boiled confection 1 (orange candy with orange flavour) and hard boiled confection 2 (lacto bon-bon with liquid condensed milk).

ii) ***Toffees :*** Toffee 1 (Royal, a modified toffee with nuts) and Toffee 2 (Espresso, a modified toffee with milk solids and coffee flavour).

iii) ***Chocolates :*** Plain chocolate and milk chocolate (with milk solids).

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To study the moisture sorption characteristics, the moisture contents of the samples were determined initially in triplicate using the standard Bureau of Indian Standards method (IS:6287-1981). The static gravimetric method was used to determine the equilibrium moisture contents (Wolf et al 1984). The experiments were carried out at 27±1°C and aw values corresponded to particular salts (Rockland 1960; Greenspan 1977). Triplicate samples (8 to 10g) in petri-dishes were placed in desiccators.

The samples were weighed at intervals of 48 hours until equilibrium in moisture content was reached, i.e. subsequent measurements gave readings of ± 0.1 mg. From the percentage moisture loss or gain, equilibrium moisture contents were calculated.

The hard-boiled confection, lacto bon-bon after equilibration was tested for hardness in tensometer (Good brand, U.K) by testing six replicates individually. The ultimate yield values in kilo Newton (kN) were noted. In the case of toffee (Royal) the shear strength was determined as Newton (N) using Warner-Bratzler shear force apparatus. Samples of dimension 2cm² were loaded flat and the peak force noted.

RESULTS AND DISCUSSION

Moisture sorption studies : The moisture sorption (desorption + adsorption) of hard boiled candies (orange and lacto bon-bon) are shown in Figure 1A. The equilibrium moisture contents (EMC) of orange candy were quite low (0.19 to 1.11%) upto 0.56 aw and it was 2.31% at 0.64 aw, while at higher values, it exhibited a steep rise. This could be attributed to the presence of sugars, sucrose and glucose (White and cake bread 1956). At a moisture content of 0.19% (aw=0.11) the product was hard and brittle while at moisture contents of 0.23 to 1.11%, the product had desirable hard texture and colour. At 2.21% moisture content, the product became slightly sticky. The BIS (1971) specifies a maximum moisture content of 8.0% for all hard boiled sweets. This corresponds to aw of 0.66. Orange candy became extremely soft even at 0.75 aw corresponding to 10.52% EMC while a further increase in water activity liquefied the products.

The other hard boiled sweet, lacto bon-bon exhibited a moisture sorption similar to that of orange candy but hard higher EMC values upto 0.75 aw. This may be due to slightly higher sorptive capacity of milk solids. The product was also hard at 0.11 aw, corresponding to 0.42% EMC white at a moisture content of 2.15% (aw=0.64) it had slightly soft surface. The product became very soft and unacceptable at 0.75 aw and mold growth was observed at a mosture content of 31.02% corresponding to aw of 0.92.

The moisture sorption isotherms of the two hard boiled sweets evaluated are of a typical high sugar food product, corresponding to the type IV of the Brunnauer-Emmett-Teller theory equation as described by Iglesias (1971).

The equilibrium moisture content-aw relationships of the two toffees are shown in Fig. 1B. The toffee, Royal with nuts showed sorption characteristics similar to that of hard boiled ones. Espresso containing coffee flavourings exhibited a "Sigmoidal" curve generally shown by foods with various constituents and different modes of water binding (Labuza 1968).

The specimen, Royal had low EMC values of 0.95 to 1.67% upto 0.56 aw, exhibiting higher values as the aw increased. At aw of 0.65, the product had acceptable attributes of good texture, colour and EMC of 2.48%. At 0.75 aw, it became very soft and watery. Thus, the critical moisture content was fixed at 2.48%. The differences in the moisture sorption capacities between the two types of toffees may be attributed to the different ingredients of nuts (in Royal) and milk, coca solids (in Espresso).

The modified toffee (Espresso) was hard upto 0.22 aw having an EMC of 4.74%. The product retained the desirable physico-chemical

properties upto 8.77% moisture level having 0.64 aw and liquefied completely above 0.75 aw.

The BIS specifies a maximum moisture content of 8.0% for all types of toffees but the results indicate that the sample (Espresso) becomes soft and unacceptable when the moisture content exceeds 2.48%.

The moisture sorption characteristics of plain and milk chocolates are shown in Figure 1C. Both of these showed almost identical moisture sorption isotherm and having low EMC values in the range of 0.3 to 1.0% upto water activity of 0.65, due to the non-sorptive property of lipid constituents. The beginning of the steep upward curve above 0.80 aw in plain chocolate and 0.75 aw in milk chocolate and higher EMC's at all water activities of the latter type are the major differences between the two. It has also been indicated that the ERH of plain and milk chocolates corresponded to 68 and 72% respectively (Minifie 1992).

The plain chocolate was hard and had bleached colour at 0.11 aw, while above 0.75 aw corresponding to 1.5% moisture content, the product was soft and unacceptable. Milk chocolate had become soft at moisture content of 2.83% having aw of 0.75. At higher aw of 0.86 and 0.92, microbial growth was observed in both samples. The isotherms indicate that at 2.0% moisture content, the aw values were 0.78 and 0.70 for plain and milk chocolates respectively at 27°C. The BIS (1971) specifies a maximum of 3.0% moisture for both plain and milk chocolates.

Texture studies : One representative sample was selected from the three types of confectioneries studied. While hardness of hard boiled sweet was determined, in the case of toffee and chocolate, the shearing force was evaluated.

The tensometer hardness of the boiled confection (lacto bon-bon) as indicated in the Table 1 showed that the hardness with a maximum value of 2.02 kN at 0.10 aw gradually decreased to 0.53 kN at 0.75 aw. The product became soft (as already indicated) at aw of 0.86 and above, and measurements could not be carried out. Since, the product was acceptable upto moisture content of 1.20% (aw = 0.56), the hardness value of 1.02 kN can be considered as the critical limit.

The Warner-Bratzler shear values of the toffee (Table 1) indicate that between 0.11 and 0.44 aw, the product showed similar values (49-56N), whereas above this water activity the shear strength decreased rapidly. At 0.56 aw, the shear strength was 31.94 N, which could be considered as the minimum limit.

The shear strength values of plain chocolate from a value in the range of 18.90 to 20.33 N decreased rapidly after 0.56 aw. Determination could not be carried out for the specimen at 0.92 aw as it bad become extremely soggy.

CONCLUSIONS

The present study of relationship between equilibrium moisture content and water activity at 27° C of the three main types of sugar confectionery indicate that, in general they indicated sorption behaviour characteristics of high-sugar food products. However, the generalised maxima of moisture contents specified by standards (BIS) have to be viewed in the context of lower critical moisture content maxima experimentally observed. The moisture sorption data and the product characteristics at various water activities can be used to design packages to provide requisite shelf-life, based on moisture interchanges and the barrier properties of packages.

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Table 1 : Texture values of confectionery items.

Water Activity	Hard boiled (Lacto bon bon) Hardness (kN) Mean	+s.d	Toffee (Royal) Shear Value (N) Mean	+ s.d.	Plain Chocolate Shear value (N) Mean	+s.d
0.11	2.02	0.03	56.26	4.20	20.33	0.44
0.22	1.88	0.02	52.30	4.90	20.24	0.44
0.32	1.65	0.04	51.95	6.52	18.90	4.09
0.44	1.37	0.04	49.33	2.75	16.68	2.45
0.56	1.02	0.08	31.94	20.46	11.30	1.56
0.64	0.69	0.02	20.46	1.25	8.01	0.31
0.75	0.53	0.04	8.81	1.02	9.31	0.62

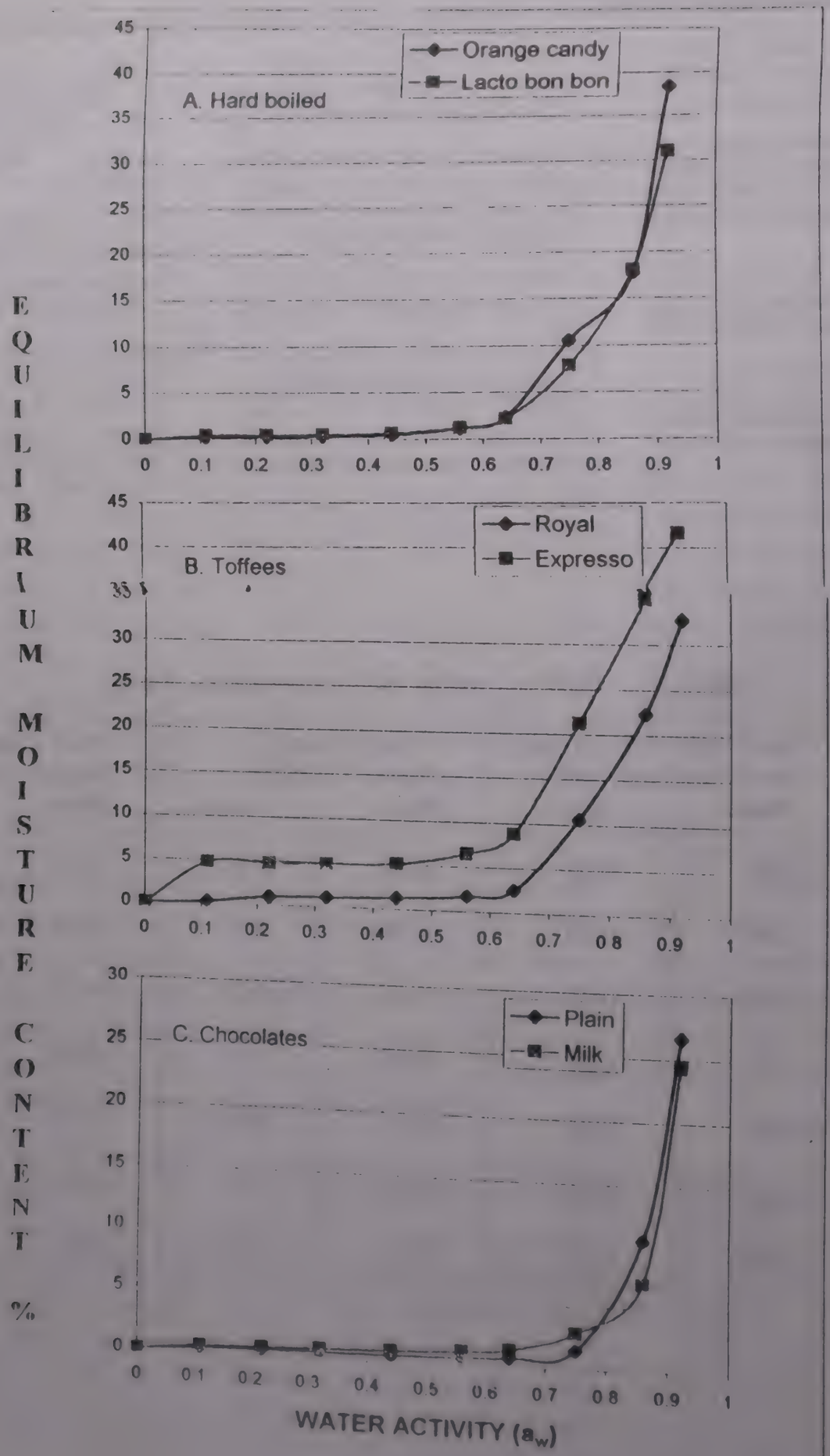

FIGURE 1 MOISTURE SORPTION ISOTHERMS OF CONFECTIONERY

REVIEW ARTICLE

BITTERNESS IN CITRUS JUICES : SOME SOLUTIONS

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ABSTRACT

Bitterness in citrus juices is mostly attributed to limonin, naringin and nomilin. Orange juice experiences delayed bitterness upon storage and heat processing. Sweet oranges are, however, free from this drawback. Solutions to the problem of bitterness of citrus juices have been looked into through research in the domains of cultivation and pre-harvest treatment of citrus fruits. Post-harvet treatments to overcome bitterness in citrus juices have largely concentrated on metabolic degradation of limonin, methods of juice extraction, masking of bitterness by different means, altering the entity of bitter principles using different techniques, and selective removal of bitter principles and their precursors through various patented techniques. The technique employing styrene-divinylbenzene resins to selectively remove the bitter principles has been successful to a great extent in overcoming the problem of bitterness in citrus juices. However, advanced research techniques in the citrus cultivation front may provide the best solution in developing citrus cultivars that do not harbour bitter principles or their precursors in the fruit.

INTRODUCTION

Like sweetness, bitterness in foods has been well perceived by man since the dawn of civilization. The consumer often rejects foods and beverages of routine consumption containing bitter principles. Citrus juices, though refreshing, and rich in minerals and vitamins, are too afflicted with this drawback of bitterness. Excessive bitterness lowers the quality and value of citrus juices. The perception of bitterness in citrus juices is influenced by such factors as pH, acidity and sweetness which may be controlled in some cases. Citrus juices are commonly derived from grapefruit, lime and lemon, mandarins, oranges, pomelo, etc. The bitterness of citrus juices is found to be attributed mostly to limonin, naringin and nomilin (Fig.1) (Roy,1990). The bitterness in grapefruit is largely due to naringin and some limonin whereas in orange juice, it is due to limonin developing during storage and heat processing. Except for grapefruit, all other citrus fruits and their respective juices when consumed fresh are not bitter. Such citrus juices experience delayed bitterness upon prolonged storage at room temperature (enzyme induced) and upon heat processing (acid catalyzed) Mair *et al.* 1977). This delayed bitterness is an important economic problem in commercial citus juice production. The sweet cultivars of oranges, namely, *Valencia and pera*, on the other hand, do not contain these bitter principles and are commonly used for commercial juice extraction and processing. However, the juices from grapefruit, mandarins, and bitter orange cultivars require reduction in

bitter commponents prior to processing in order to enhance their consumer acceptance.

World demand for citrus juices has been increasing steadily and the 21st century faces a daunting task to meet the growing demand. Though India produces nearly four million tonnes of citrus fruits (FAO, 1998), the oranges and mandarins are downgraded for processing because of the delayed bitterness problem. The high levels of acids in the early harvested fruits further compound consumer aversion for these juices. However, fresh orange (*Citrus reticulata*), mosambi (*Citrus sinensis*) and kinnow (a hybrid of King and Willow-leaf mandarins i.e.*Citrus nobilis X Citrus deliciosa*) juice dispensed by vendors, is relished in all parts of the country. Processing is confined to orange, lime and lemon squash and syrups only. The packaged orange juice recently launched in the Indian market is largely produced from imported concentrates.

Scope of Solutions to Bitterness

The advent of improved techniques of cultivation has resulted in flooding of markets in some parts of the world with citrus fruits, oranges in particular. Food and Agriculture Organisation reports a World production of about 98.6 million tonnes of citrus fruits in 1998 (FAO, 1998). Limitations in storage and transportation has necessitated processing, e.g.concentration of the juice but the problem of delayed bitterness persists. Solutions to this problem have been looked into through research in the domains of cultivation, pre-harvest and post-harvest treatment of citrus fruits. Many of the developments in this direction have been the subjects of patents.

Cultivation: The level of bitter principles or their precursors is influenced by a number of factors including maturity, variety/cultivar, rootstock, cultural practices, and geographic location among others (Kefford and Chandler, 1961). The immature fruits usually yield bitter juice, but as ripening progresses bitterness decreases and may eventually disappear . Early maturing varieties on the other hand usually give juices free from bitterness at normal ripeness. Late maturing varieties on the other hand usually give juices free from bitterness at normal ripeness. *Valencia and pera* varieties of orange produce juice which is sweet and does not suffer from delayed bitterness syndrome whereas navel oranges particularly early to mid-season, produce juice which turns bitter upon processing. Similarly, the juice of Assam oranges is considered free from bitterness whereas that of the Nagpur and Coorg mandarin oranges has the tendency to turn bitter (Siddappa and Bhatia, 1959). Preliminary studies have shown that the Kinnow fruits grown in Hoshiarpur district (Punjab) yield juice which contains lower level of limonin compared to the juice obtained from the fruits grwon in the districts of Ferozepur (Punjab) and Sri Ganganagar (Rajasthan)(Berry et al.1993). These differences are perhaps attributed to the limonoid UDP-D glucose transferase activity that bring about conversion of limonoid aglycones into limonoid glucosides, which are tasteless (Hasegawa and Miyake, 1996). Sweet oranges in general have been found to possess relatively high levels of limonoid UDP-D - glucose transferase activity. In contrast, the bitter oranges, *pomelo*, etc. have very low activity levels of this enzyme; hence juices from fruits harvested even at very late season possess severe lmonoid bitterness problem. The limonoid glucosides that accumulate in citrus fruit tissue are reported to be very stable.

Selection of suitable cultivar and geographic location, judicious fertilizer application and irrigation are some of the important factors that promote production of fruits with lower levels of bitterness in the juice. It has been shown that trifoliate orange, Cleopatra mandarin and tangello rootstocks also promote the disapperance of bitter principles from all parts of the fruit with advancing maturity (Kefford and Chandler, 1961). This facility may be exploited to develop orange cultivars with very low or negligible levels of bitter principles in the fruit.

Pre-harvest treatment: Application of preharvest sprays of 2-(3,4-dimethylphenoxy) triethylamine, 2-(3,4-dichlorophenylthio) triethylamine, and 2-(4-ethylphenoxy) triethylamine to the citrus trees, have been found to

inhibit the biosynthesis of bitter principles in citrus fruits (Hasegawa and Maier, 1983).

Harvesting :The level of limonin is generally high in the juice from oranges harvested early season, i.e., as soon as the commercial maturity is reached. On the other hand, the fruits harvested late in the season, generally 3 to 6 months later, are sweeter and yield juice in which limonin content is very low or even nil. Kinnow fruits (Berry et al. 1993) harvested during March/April are found sweeter and yield juice containing limonin below threshold level (<6ppm). This disappearance of bitterness is perhaps owing to the process of biosynthesis whereby the limonoid aglycones, e.g.limonin A-ring lactone undergoes enzyme (limonoid UDP - D - glucose transfearase) mediated glucosidation producing bitterless limonin glucoside (Hasegawa and Miyake, 1996). However, because of economic and marketing considerations, initial fruit harvest cannot be delayed until late season when juice limonin is nil. Mid season fruits will, therefore, find preference for processing juice with acceptable level of bitterness. There are also season to season variations in limonin content of the citrus juices.

Post-harvest Treatment:

a) *Metabolic degradation of limonin:* The storage of fruits at room temperature brings about partial reduction in limonin content in the juice due to metabolic degradation of limonoid precursors. However, prolonged storage affects other quality parameters and is economically not feasible. Exposure of fruits to ethylene gas or spraying fruits with 2-chloroethylphosphoric acid in wax accelerates limoniod metabolism yielding juice with substantial reduction in limonin without producing off flavours. Cycloheximide and other compounds that decompose to yield ethylene or that promote exogenous ethylene production offer alternative to the use of ethylene gas for achieving similar effect. But, the commercial use of such compounds would depend upon prior clearance of national regulatory authorities. Ethylene gas treatment has, however, no effect on naringin content of grapefruit (Maier et al. 1977).

b) *Method of juice extraction:* The seeds, albedo, central vascular bundle, and carpellary membranes of the fruit contain high levels of limonin or its precursor. Grinding and maceration of these tissues, and period of contact of the juice with these tissues result in enhancement of bitterness of the juice. Thus gentle extraction techniques, filtering the juice immediately after reaming, and exclusion of air can result in juice low in or free from bitterness. The extractor pressure and extractor types also affect the limonin content of the juice (Fellers, 1989). The juice extracted by using the Taglith extractor is reported to be comparatively less bitter but the juice yield is low. On the other hand, small and medium scale processors cannot afford to install the Taglith extractor (Bhalerao and Mulmuley, 1992).

c) *Masking bitterness:* Sugar:acid ratio and pH influence the bitterness threshold of limonin. The optimum pH for limonin bitterness supperssion, i.e.maximum threshold(~6ppm) is 3.8 in orange juice (Guadagni et al. 1993). Any increase in pH though lowers the bitterness; the overall quality of the juice is adversely affected. Addition of sucrose to juice also reduces bitterness but this is not permitted in the natural juice in many countries. Besides, sucrose addition imposes extra cost on the processor, and it is nutritionally undesirable and complicate the authentication of fruit juices. Blending of non-bitter juice with bitter juice in proper ratio to attain most favourable threshold is however allowed and is commonly practiced in industry.

The natural citrus consituents, neohesperidin dihydrochalcone, hesperitin dihydrochalcone glucoside, rhoifolin and neodiosmin when added to the juice suppress the bitter taste of limonin and naringin by

increasing the threshold for these bitter principles. For example, addition of 60 to 100 ppm of neodiosmin to orange juice containing 10 ppm limonin, reduces the limonin bitterness to the equivalent of 4 to 5 ppm limonin in the juice. Neodiosmin perhaps acts as competitor with the bitter principles for sites in the taste receptors (Roy, 1990).

Altering the entily of bitter principles: Changing the entity of bitter principles *in situ* into non-bitter form reduces the bitterness of citrus juices. Treatment of orange juice or orange segments with alkali raises the pH sufficiently to hydrolyze the D-ring lactone or both the lactone rings of limonin thereby converting it into non-bitter hydroxy-acid form. The enzymes, limonin D-ring lactone hydrolase and linonoate dehydrogenase too catalyse the conversion of limonin to non-bitter stable forms (Maier et al. 1977). The micoorganisms (for example, *Pseudomonas 321-18, Arthrobacter globiforms, Acinetobacter sp., Bacterium 342-152-1, Corynebacterium fascians,* and *Rhodococcus fascians)* which elaborate these enzymes may be used in an immobilized cell system to effect the debittering of orange juice (Hasegawa and Maier, 1983; Puri et al.1996). Grapefruit juice, the bitterness of which is largely attributed to naringin, becomes considerbly less better when subjected to a selective fermentation process. Similarly, naringinase *(from Aspergillus niger* or *Penicillium sp.)* immobilized on a suitable support, may be used to debitter grapefruit juice in a continuous manner (Tsen and Yu, 1991). Exposure of juice to cellulose acetate films containing naringinase decreases naringin and limonin contents of grapefruit juice due to the action of the enzyme and by sorption respectively (Soares and Hotchkiss, 1998). The enzymatic action appears to chop off the glycoside moity attached to the naringin molecule resulting in tasteless compound. However, the enzymatic treatments appear to affect the overall flavour and taste of the juice. Moreover, the use of such selective enzymes / microorganisms on commercial scale escalates the cost of debittering.

Selective Removal of Bitter Principles and their Precursors:

a) *Precipitation Method:* Addition of sucrose and pectin to the juice affect the solubility properities of limonin. Also selective enzymes e.g. pectolytic enzymes, that attack other juice constituents may be used to effect changes in the properties of the juice that bring about physical removal of limonin from true solution thereby decreasing the bitterness of the juice(Chandler, 1971).

b) *Extraction Methods* : (i) *Treatment with carbon:* The orange juice is first extracted with propan 2-ol solvent. The extract is then treated with active carbon to adsorb the bitter principle, limonin. After evaporating the solvent, the other juice solids are added back to the treated juice thus maintaining the integrity and original taste and flavour characteristic of the juice (Johnson and Chandler, 1988).

(ii) *Supercritical extraction:* Carbon dioxide under supercritical conditions of pressure (3000-6000 psi) and temperature (30-60°C) may be employed to partially remove limonin. There is negligible effect on the other constituents e.g.ascorbic acid, pulp, citric acid, amino acids, etc. of the juice. The oil content may decrease slightly but the same can be easily replenished in commercial operations without violation of standards of identity (Kimball, 1987).

c) *Adsorption Methods* : A wide range of adsorbents has been used with an attempt to selectively remove the bitter principles, limonin and naringin from citrus juices at laboratory scale. (Table 1). Keeping in mind the standards of identity, the process employing any one of these adsorbents, must be applied in such a way that the

sensory attributes of the juice other than bitterness and acidity, are not impaired and the characteristic composition and nutritional value of the juice is not altered. Only a select few of these adsorbents meet the regulatory requirements and various degrees of debittering have been achieved (Johnson and Chandler, 1988).

There are two basic methods to treat juices with absorbents e.g.fixed-bed and stirred-bed methods (Johnson and Chandler, 1988). In the fixed-bed method the juice is passed down through the bed of adsorbent contained in a column. This method though efficient, required removal of the pulp from the juice. In the stirred-bed method either the adsorbent or the juice or both are agitated. This has been performed in two ways using the fluidized - bed or stirred-tank techniques. In the fluidized-bed technique, the juice passes upwards through a bed of adsorbent which is agitated by adjusting the flow rate of the juice or by purging with inert gas or by using a mechanical agitator. The stirred-tank technique employs the adsorbent-in -cage contactor (Fig.3). The juice is held in the tank. The stainless steel mesh cage containning the absorbent is continuously oscillated up and down in the tank. The juice is pumped through the tank continuously. The advantage of this technique is that whole, uncentrifuged juice can be treated on a flow -through basis and the adsorbates (the bitter principles and the titratable acids) are not reduced to zero level thus maintaining the taste balance of the juice.

The fixed- bed column and the stirred-tank methods are being commercially employed in USA and Australia respectively to debitter orange and grapefruit juices. The absorbents made of styrene-divinylbenzene polymer beads with specific degree of crosslinking, surface area, mean pore diameter, and solid density are being exploited to selectively trap limonin and its precursor, and naringin (Mathews et al. 1990) The commercial debittering system developed in USA consists of a commercial vacuum distiller to remove excess oil from freshly extracted juice, two parallel contrifuges to remove excess pulp that may clog the adsorbent, and two SS columns containing the absorbent that can be used alternatively for treatment and regeneration in a continuous process to process the juice. The oil and the pulp removed are added back to the juice for original sensory appeal (Fig.2 and 4). In this process, it is claimed that the adsorption of bitter principles is quite selective.It is further emphsized that no significant changes in minerals, organic acids, amino acids, carbohydrates, carotenoids or flavonoids and other nutrients are observed (Kimball and Norman, 1990). The vitamin-C level in the juice, if required, may be increased by supplementation.

Attempts have also been made to debitter kinnow juice on laboratory scale using Amberlite resins packed in glass columns (Premi et al. 1995; Barwal and Kalia, 1996).Berry et al. (1993) developed a semi-pilot plant scale fixed-bed column unit using indigenously prepared polystyrene based adsorbent resin and successfully debittered kinnow juice which, after reconstitution, possessed natural taste properties except the bitterness. The process needs further scale up to assess its technological and economic viability.

CONCLUSION

Research conducted mainly in Australia and USA during the last four decades has shown numerous possibilities to overcome bitterness problem associated with citrus juices. None of the methods is perfect with respect to alteration in the composition of the juice and generally do not fully fulfil the criteria, viz., "nothing should be added to or be removed from the juice" stipulated by the Food and Drug Administration, USA. Notwithstanding,the adsorbent process employing styrene divinylbenzene polymer as selective adsorbent for bitter principles has been found promising and is being commercially exploited in USA, Italy and Australia. Advanced research techniques in citrus cultivation front may, however, provide the best solution through developing citrus cultivars that do not harbour bitter principles or their precursors in the fruit. Development of transgenic citrus varieties through genetic engineering may be the most promising approach to overcome bitterness in citrus juices (Ilasegawa et al. 1997).

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TABLE 1 : LIST OF ADSORBENTS

Active carbon.

Florisil (activated magnesium silicate).

Polyamide and polyviny1 pyrrolidone resins.

Beta-cyclodextrin(monomer or polymer).

Nylon.

Cellulose esters and cellulose acetates employed as powders, beads or as films for lining containers.

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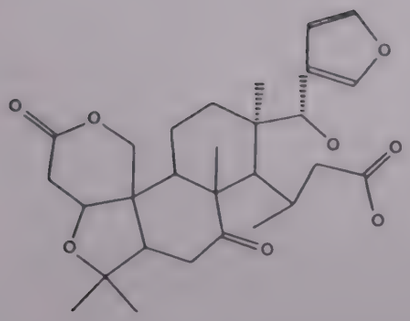
Styrene-divinyl benzene resins with different levels of cross linkages

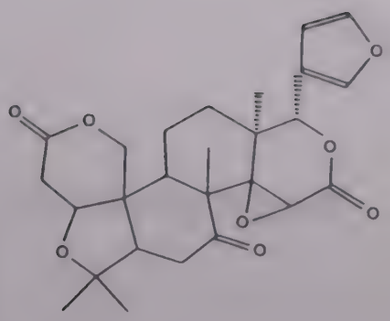
Polystyrene based resins incorporating basic amino groups to remove the bitter principles and titratable acids in one operation.

Cellulose acetate films impregnated with naringinase to remove limonin and naringin at the same time.

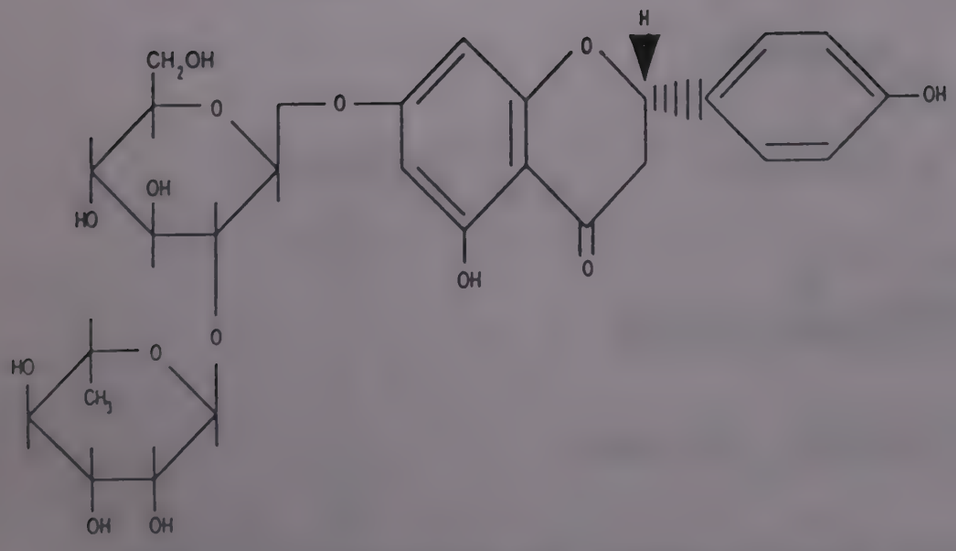
Fibre ultrafilteration cartridges and polystyrene divinylbenzene resin, etc



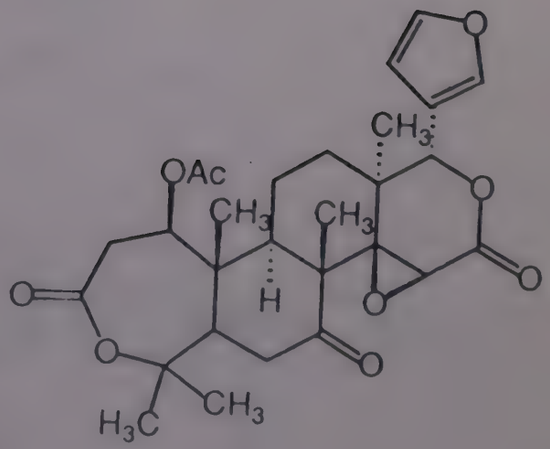
LIMONOIC ACID
A-Ring Lactone



LIMONIN



NARINGIN



NOMILIN

FIG.1: CHEMICAL STRUCTURE OF CITRUS BITTER PRINCIPLES

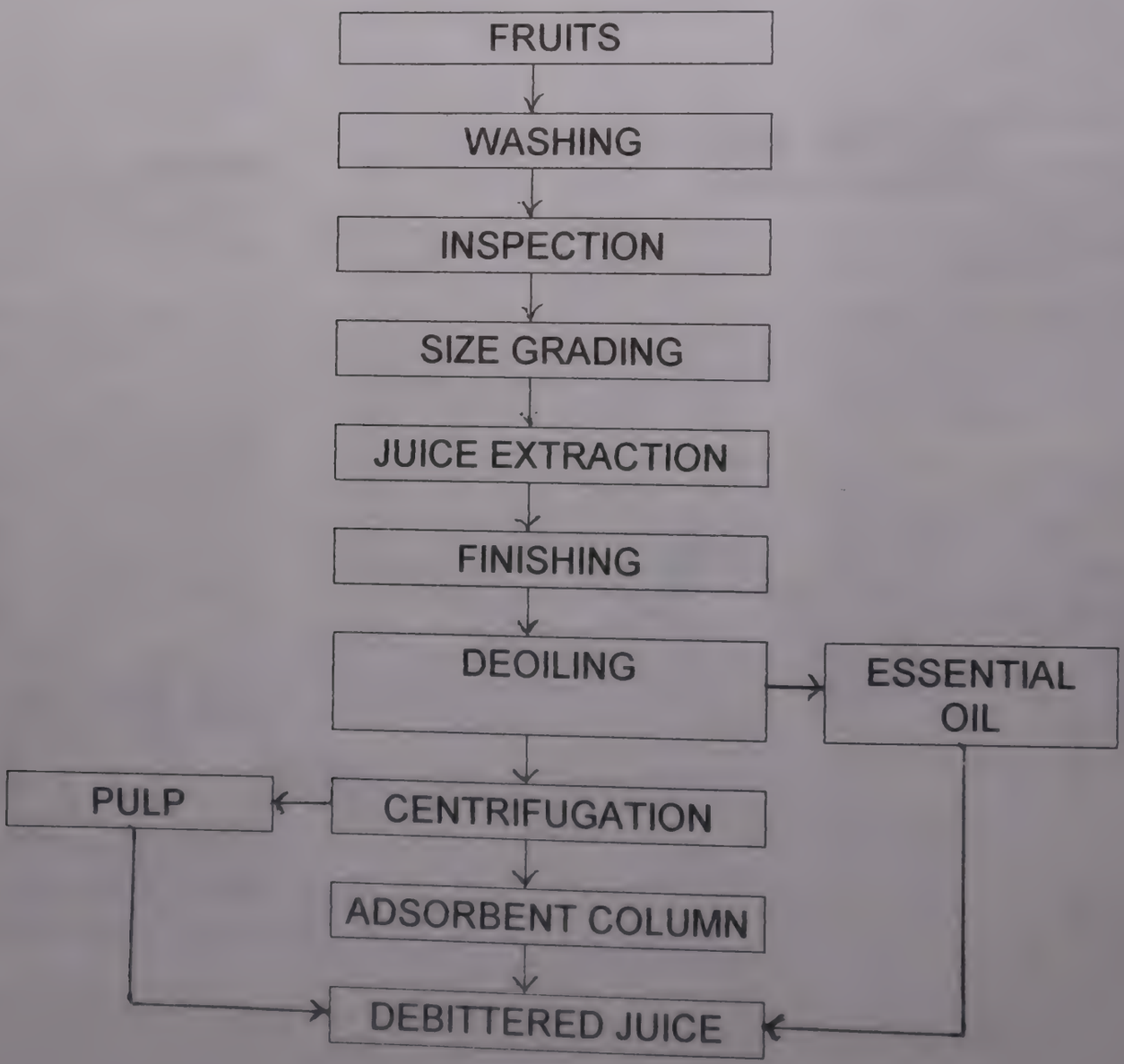


FIG. 2: PROCESS FLOW DIAGRAM OF UNIT OPERATIONS FOR DEBITTERING CITRUS JUICE

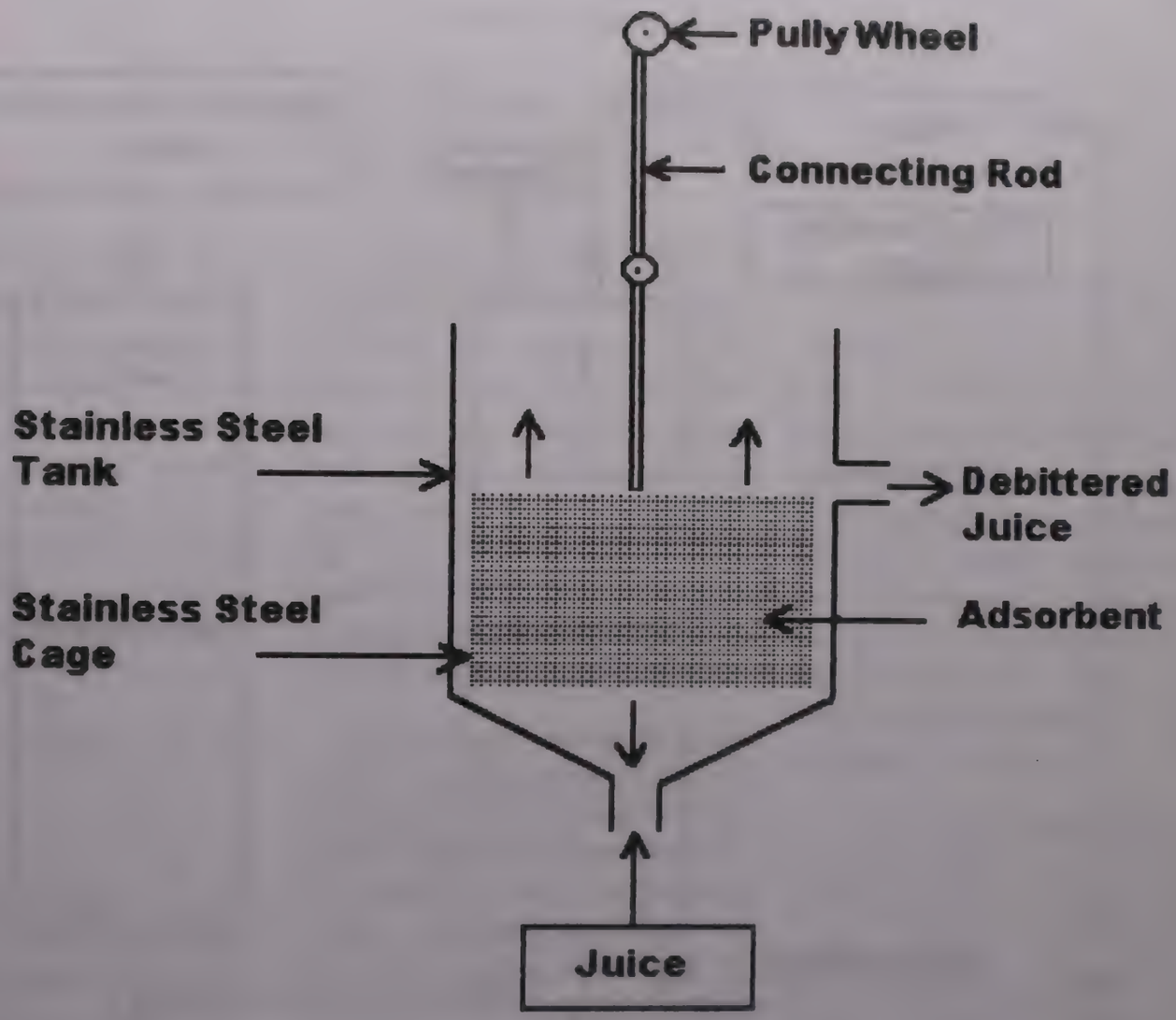


Fig.3: Diagram of a portion of stirred tank adsorbent-in-cage contactor debittering system.
(Adapted from Johnson and Chandler, 1985)

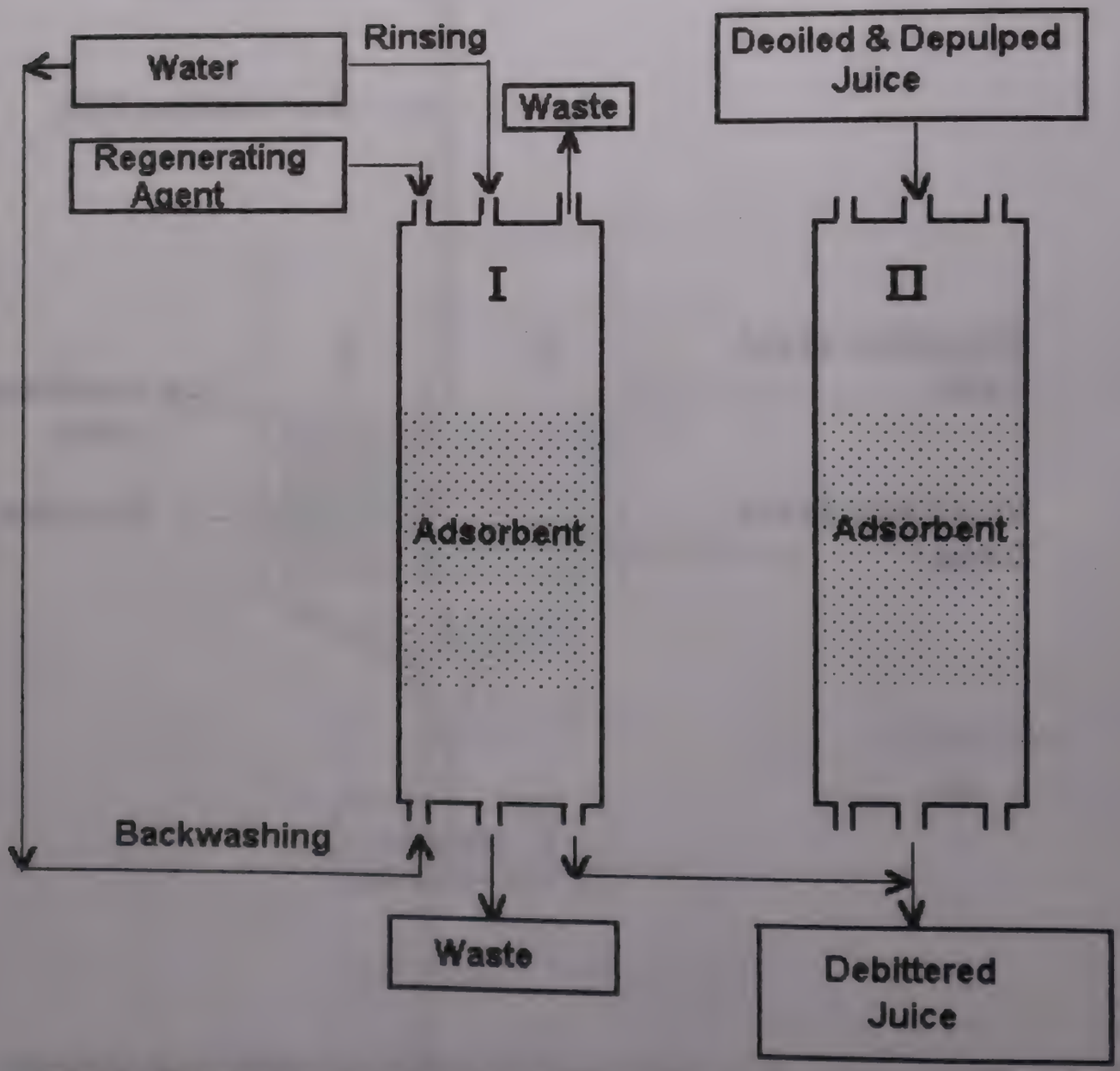


Fig.4: Diagram of fixed-bed column debittering system

(Adapted from Norman and Kimball, 1990)

GENERAL ARTICLES

FOOD PROCESSING INDUSTRY IN INDIA*

Omesh Saigal

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New Delhi 110049

Although we are one of the largest producers of raw materials for the food processing industry in the world, the industry itself is extremely under-developed in India. Less than 2% of fruit and vegetable production is processed, compared with 30% in Thailand, 70% in Brazil, 78% in Philippines and 80% in Malaysia. The value addition in the food sector is still very low at 7%.

In the last decade, India has moved from an era of scarcity to one of plenty. The production of fruits and vegetables which was just 50% of the total quantity of food grains production had now become 66% of the total quantity of production of food grains. By the year 2010, it is estimated that the production of fruits and vegetables would be 80% of the quantity of food grains produced in India. Coupled with the fact that the yield of these crops in India is just about one-third, compared to other countries, we can imagine the sort of spurt that is probable in the sector.

In the situation that prevails in India. 90% of the fruits and vegetables produced are marketed by the farmers as compared to less than 20% of cereals. This shows that the main challenge the food sector is going to face in the coming decades will be one of marketing, which hitherto has been a major constraint in its growth and it is here that the thrust of our policy will have to be.

The primary reason why the food processing sector has not developed is that agriculture has largely been for subsistence and not market driven. This has not yielded adequate surpluses for processing and coupled with it, the low yield of crops has choked. it.

In this scenario, food processing becomes critical. This would mop up surpluses at farm level and ensure fair price for the producer. It would also ensure availability of the produce at reasonable price for the consumer. In addition, the employment generation potential of this sector is much higher than other sectors i.e. 54,000 persons get direct employment per 1,000 crore of investment in the food sector in comparison to 48,000 in textiles and 25,000 in paper industry. There is also a 4-fold generation of indirect employment in ancillary and other downstream activities on account of the investment in food sector. Furthermore, 60% of the employment generation is in small towns and rural areas.

The primary reason why the food processing sector has not developed is that agriculture has largely been for subsistence and not market driven. This has not yielded adequate surpluses for processing and coupled with it, the low yield of crops has choked it. The lack of awareness about the processable variety of raw material and the non-availability of suitable raw material in terms of size, colour, texture, etc., has contributed to the absence of volumes of processable varieties therefore, economies of

* Reprinted from *Indian Food Industry*, March - April 2001

scale. The present tax structure also drives a wedge between branded products manufactured in the organized sector and products from the unorganized sector. In fact, the tax in India on processed food is amongst the highest in the world and has been a major single impediment in attracting investments, both locally and from abroad. This is coupled with the fad that investments in the processing industries are in any case at high risk and yield low returns. Investments are further depressed because despite the apparent advantage of hygiene and quality, the price sensitive Indian consumer has stayed away from the high priced packaged foodstuff.

Another reason for poor processing is the high risk and low margin of this sector on account of seasonality, non-availability of raw material, high inventory carrying cost due to purchases at the time of abundance and the very high cost of packaging, i.e., around 40% of the estimates of product price. Lastly, the issue of poor infrastructure, such as lack of integrated cold chain, roads, power, etc., has also hampered processing.

There is need to aim at increasing food processing from a low of 2% as at present to 10% by 2010. This would entail an investment of Rs. 1,40,000 crore in the food processing sector. The investment would generate direct employment for about 77 lakh persons and indirect employment for about 3 crores. This would also reduce wastages by about Rs.8,000 crore. Apart from these advantages, the value addition of food products will go up from 7% to 35% which will be reflected in corresponding increases in GNP. The thrust will, therefore, have to be to attract foreign and domestic investments and generate internal accruals of the above said magnitude. It is relevant to note that in the first few years after 1991-92, when the industry was de-licensed and major impediments on FDI were removed, a total investment of Rs. 7,200 crore was committed. This trend was reversed only when excise duty was first introduced in 1997-98.

The existence of multifarious laws and multiple authorities is a major hurdle. Many of these laws were framed some 50 years ago like Prevention of Food Adulteration Act and were meant to serve the purpose of food safety and to prevent adulteration. Similarly, many of the statutory orders like Fruit Products Order, Meat and Meat Products Order and Milk and Milk Products Order were brought into being under the Essential Commodities Act when there was acute scarcity of food items. In the context of liberalization, these laws throttle development and invariably work as dampeners for the growth of the industry. There is, therefore, an acute need for harmonizing the existing food laws and to bring about a development orientation to facilitate faster growth of the industry.

This approach would bring about corporate entities operating large integrated food procurement cum distribution companies, which operate from the farm to the department store. In this changed scenario, the small scale industries, which constitute the majority of the food processing industries need to be adequately protected. In order to provide adequate protection and help them, the industrial corporates as delineated above will have to become anchors to assist and nurture them. Besides these anchor industrial corporates, a number of food parks could be established so as to provide adequate help in adhering to international standards by means of establishment of common facilities. The chosen/ anchor industries will help them to market the primary and secondary levels of processed items and to convert them into value added products for sale through their different network of distribution channels including export.

In the short term, by means of bringing about a tax holiday for the food processing sector for a period of 10 years, a proper enabling environment can be created for bringing in adequate investments both from within the country and through foreign direct investment.

Such a tax holiday, need not cover tabacco, aerated drinks, Indian made foreign liquor and plantation items. The enactment of Processed Food Development Act and measures for generic promotion can

also be done along with industry in locating markets by means of market intelligence. The attempt during the short term period of say the next 3 years should be to develop a strong data base and a market intelligence network. Besides these, certain special provisions will also have to be made for development of North-Eastern region, hilly areas, islands, ITDP, desert areas and other difficult areas.

In the medium term of 5 to 10 years, the policy framework should attempt to establish a network of R & D institutions. Identification of anchor industrial corporates and development of food parks in all the States with reference to their regional strengths could be achieved during this period.

Worldwide, the food processing industries are considered sunrise industries and have the potential of attracting huge local and foreign investments. These investments will not only accelerate the pace of industrialization, but will also lead to improvements in both rural and urban infrastructure.

Appropriate policies and schemes could be envisaged for establishment of cold chain and development related infrastructure, development and transer of new technologies and product specific packaging, development of appropriate processable varieties of raw material, bringing about future's trading and equalisation funds as well. Establishment of network of institutions and testing laboratories could be aimed at in this period to achieve international standards and make Indian products export-worthy. There is a need to propagate non-polluting, cheap technolo-gies, e.g., irradiation and biotechnology for preservation of food.

One of the key resultants of the Policy is the Food Processing Development Act. The proposed Act envisages a single authority for harmonizing and clarifying the function of each player. The department of FPI will have the role of development while food safety, distribution and other regulatory functions will continue to be administered under existing legislations. The Act would have a developmental focus rather than regulatory nature of the present enactments. The emphasis will be on development of the FP Sector as a whole, the concept of merit goods and encouragement to industries producing merit goods, equalization fund and future's trading for price stability and the need to take congisance of genetically modified foods and government response to them., The policies and guidelines in FP Sector be they relate to HRD, R & D, taxation or regulations also need to be addressed holistically.

In conclusion, it can be said that while the current level of food processing may reflect the primitive rural marketing structure, improvements in this sector can bring about vast improvements in value addition in agricultural products, creation of new employment, especially in the small towns and rural areas, improvement in the nutritional status of the rural women and the poor and availability of cheaper and better products for the consumers. Worldwide, the food processing industries are considered sunrise industries and have the potential of attracting huge local and foreign investments. These investments will not only accelerate the pace of industrialization , but will also lead to improvements in both rural and urban infrastructure. A well run food processing industry ensures that while on one hand the producer gets remunerative price for his product, the consumer pays less for higher and assured quality. The price to be paid in the shape of tax holiday may, no doubt, mean a few crores of loss to the exchequer, but that will be more than amply compensated by the additional investment inflows as also by long term gains to the Government's fiscal resources.

It will be no axiom to say that 'a food processing unit a day will keep poverty and backwardness at bay.'

TINPLATE CONTAINERS FOR FOOD

Sanjay Bhatia

Managing Director, Hindustan Tin Works Ltd.

The earliest record of the preservation of perishable food materials by thermal treatment in hermetically sealed containers is found in the classic work of Spallazani in 1765. During his experimentations in connection with orgin of life, he found that organic infusions could be protected against spoilage by prolonged heating in a well corked bottle. However, Nicolas Appert is considered as the father of the canning industry as he was the first to employ consciously the process of heat treatment and hermetic sealing in the preservation of food, During the Nepoleanic wars, the need for a method of preserving food for Army became so pressing that the French government announced a prize of 12000 francs to anyone, who could device a method of food preservation which would insure wholesome food. Appert came up with the solution after several years of experimentation and in 1804, submitted samples which were found to be acceptable. The prize was awarded to him which aided him in establishing "The House Of Appert", a commercial organisation which continues to exist even to date.

The following decade saw the development of canning industry in England and America and simultaneously several can making companies sprang up. The growing importance of the industry led to the formation of the National Canners Association in America in 1907. In 1913, the research laboratory of the association was established in Washington with branches in Seattle and San Francisco. The work of these laboratories and the research departments of various can manufacturers made the present high quality of canned food at low cost, possible.

More than 400 different varieties of food are preserved by canning and the number is constantly changing. The list includes practically all of the fruits and vegetables grown, a wide variety of meats and meat specialties, sea foods, soups, strained and chopped foods for infant feeding, fruits and vegetable juices and many gourmet products, puddings and sauces. The annual pack of all products runs into several billions of cans. Today, a wide array of packaging materials are available in the market but tinplate container is still the best packaging solution available to the world.

The characteristics of an ideal container for canned food are :

1. Strong enough to protect its contents adequately in shipping.
2. Ease of fabrication into desired sizes.
3. Light for economical handling.
4. Readily opened.
5. Impervious to air and water.
6. Of pleasing and sanitary appearance.
7. Not harmful or toxic to the contents.
8. Capable of being heat sterilized.
9. Inexpensive enough to discard after use.
10. Ease of being hermetically sealed at high speed.
11. Excellent printability and lacquerability.
12. Environmental friendly.

These qualities are very well met by tinplate containers.

Although, the earliest canning was done in glass containers, within a few years, tinplate containers came into wide spread use. For many years, cans were made by band and were either of the open top, hand soldered style or the hole and cap type. Around 1900, the sanitary can which is sealed mechanically with soldered side seam was developed and today the modern can makers have done away with soldering and developed welded can bodies. The soldered cans had posed the problem of possible lead contamination in the products packed and with the advent of welded cans, this problem was totally obviated. The ends were provided with a non-toxic process resistant rubber seal and thus there was no need for soldering the ends. The modern cans are made mechanically on a series of machines known as a can line at a rate in excess of 300 cans per minute.

The material from which the can is made consists of a steel base plate coated with tin. Prior to the acute need of tin conservation which was occasioned by the war with Japan, the tin coating was applied by hot dipping method. This method of tinning was eventually found to be uneconomical and non - uniform

and was replaced by electrolytic tinning process. Considerable economy was thus effected by applying a thinner and uniform coating of tin as also differential coating on either side of the tinplate depending on usage.

Depending on the nature of the product, its electrochemical behavior, type of pigment responsible for its sulphurating properties etc, different grades of steel and tin coating weights can be selected to meet different product needs.

In the manufacture of cans from any type of plate, the can sometimes may be enameled on the internal surface in order to protect the food against corrosion or sulphur staining. Various enamels are now available to meet this requirement. Similarly, to protect the can against external corrosion cans are often decorated by printing in attractive designs or lacquered.

Tin cans are no more confined to foods alone; a large number of non food products are also packed in metal cans such as lube oils, greases, paints, pesticides, varnishes, shoe polishes etc to name a few.

Canned Foods in relation to health :

The relation of any food to health of the consumers involves two main considerations

a) Nutritive value

b) Toxicological aspect

The canning industry has been concerned with a study of the nutritive value of canned foods practically from the beginning of modern activity in the field of nutrition research by means of animal feeding tests. It has been established that all requirements of an adequate diet could be met by the use of a variety of canned foods. The actual experimentations have been carried out by Institutes of Nutrition and Dietetics and their findings based on their continuing programme of basic research have re-emphasized the fact that canned foods in every respect are equal in nutritive vaiue to the same foods cooked in any other way. No other package provides such protection to food stuff as tin containers.

Referring now to the toxicological aspect of canned foods, the experience of the canning industry justifies that tinplate cans do not pose any threat to health. The metallic salts which may be present in canned food are those which can be acquired from contact of the food product with the food handling machinery and the tin containers. These are almost exclusively tin and iron. The quantity of these will vary somewhat with the food but in all cases is small and without any health significance.

The industry did recognize the possibility of lead contamination from solder which sometimes creeps through the soldered side seam to the interior of the can during fabrication. As mentioned earlier, improvements in can making technology have replaced soldering with welding process and thereby eliminated lead bearing surfaces from the cans completely.

In combating insect pests, various toxic sprays and dusts are commonly used on fruits and vegetables during the growing season. Any spray residue which may still be present at the time of harvesting are usually removed by thorough washing given to the fruit or vegetable during preparation for canning.

Cases of illness due to food borne pathogenic organisms are of much more frequent occurrence than those due to ingestion of food borne toxic chemicals. The micro organisms in foods are destroyed by thermal sterilisation; however, should there be any viable organism present in the can, due to processing inadequacies or defective seaming, the cans will exhibit bulging of ends. The modern Sanitary ends are designed to show up any spoilage inside the can with the engineered expansion ring feature built in the ends. Bulged cans should be discarded as spoilt.

Fallacies about canned foods: With some products, however, the food is assumed to develop "Ptomatnes" or some ill defined toxic principle, unless promptly emptied into another container or vessel. This belief has sometimes been supported by attending physicians in cases of illness presenting classical symptoms of nausia, vomiting and diarrhoea, either because of lack of knowledge or as a convenient diagnosis readily acceptable to the patient. There are some foods, which should be transferred from the tin container after opening, not because of any danger to health. A number of acid products are quite corrosive in the presence of oxygen. If held in an open can these products attack the container and unless used within a few hours may become astringent and the flavour and the colour may be impaired due to iron pick up. Nevertheless, for most canned foods, the can is perhaps the best container

for an unused portion of the food because it was at least sterile at the time of opening, while a dish or a pan is likely to serve as a source of bacterial contamination, which will find a suitable environment for growth.

Research and Development in can making technology is making rapid strides continually to keep pace with the developments in the food sector and working out expedients to lower the costs and extending service life of the cans with ever expanding product lines and their exacting requirements and meeting the market needs. In the direction of cost reduction without sacrificing the performance of cans, extensive research has now brought about the development of double reduced tin plate or 2CR plate. The steel plate in 2CR has an average 30-35% gauge reduction with additional strength due to work hardening and sufficient ductility to form the can bodies and ends satisfactorily.

Low tin coated steel (LTS) with a nominal tin coating mass of 1.1 gm/m^2 has been developed as a substitute for 2.8 gm/m^2 tin coated plate. The product has been found to be suitable for carbonated beverages, beer, fruits and juices. LTS has excellent corrosion resistance, good lacquer ability/ printability and weld ability due to a duplex coating on steel substrate. The material has a very thin layer of free tin on the steel base followed by chromium-chromium oxide protective layer.

As tin has always been a relatively expensive commodity, a most widely used alternative system now is electrolytic chromium/ chromium oxide coated steel called TFS or tin free steel. This material gives good lacquer ability and is widely used for making can ends and drawn cans. Welding of TFS is difficult due to metallic coating on steel. Unless this is removed along the edges of the metal blank to be welded it poses problems in welding. Different hybrid versions are being tried to overcome the limitations of TFS. TFS cans are being used for non-critical products such as tea and coffee where the cans are side seam cemented with plastic polyamide resin cements. However enameled TFS ends are used for processed food cans satisfactorily.

In the sphere of convenience of handling of cans by consumers, easy open pull-tab devise has been developed which has become very popular in the soft drinks, juices, beer can sector and some processed foods as well.

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